

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Transition from TTY to Real-Time Text)	CG Docket No. 16-145
Technology)	
)	
Petition For Rulemaking To Update The)	GN Docket No. 15-178
Commission's Rules For Access To Support)	
The Transition From TTY To Real-Time Text)	
Technology, And Petition For Waiver Of Rules)	
Requiring Support Of TTY Technology)	

To: The Commission

**COMMENTS OF
THE BOULDER REGIONAL EMERGENCY TELEPHONE SERVICE AUTHORITY**

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Summary

The transition from TTY to Real-Time Text (“RTT”) technology will be an important step in enabling the deaf and hard-of-hearing community and others with communications disabilities to more easily communicate with others. BRETSA’s concern is with the positive, and negative, impacts of the transition to RTT *on PSAPs*.

The transition to RTT does not eliminate the need for true SMS-based Text-to-911, to assure that individuals in need of assistance can reach 9-1-1, to allow PSAPs to transition to RTT as they are able, and to allow PSAPs to manage call volumes during major incidents.

PSAPs cannot be expected and should not be mandated to support all implementations and forms of RTT, including RTT over video or voice. Only a small percentage of people have the unique skillset to serve as a PSAP Telecommunicator. They are already required to master a dizzying array of PSAP systems, business rules, statutes and ordinances, etc. Dispatchers in the vast majority of PSAPs which rarely receive a TTY call or text-to-911 message cannot possibly be expected or required to also maintain sufficient sign-language proficiency to communicate with a deaf or hard-of-hearing person excited by the incident they are reporting, via any of the several sign languages in use, some with their own syntax and word order. PSAP efficiency in responding appropriately to *all* callers must be maintained in the face of finite resources and capabilities.

Telephone Relay Services and IP Relay Services (“TRS”) will continue to play a vital role. However the ability of TRS to handle emergency calls must be improved. NG9-1-1 may contribute to this improvement.

Establishment of a basic standard for RTT is essential, but as more features are added to the standard, the less it appears to be a *basic* standard and the more likely it is to inhibit marketplace innovation.

The Commission must remain cognizant of assistive and health- and medical-related technologies which are incompatible with digital IP networks.

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The Boulder Regional Emergency Telephone Service Authority (“BRETSA”), by its attorney, hereby submits it’s Comments on the Commission’s April 29, 2016 Notice of Proposed Rulemaking in the above-referenced Docket (“NPRM”).¹

I. The Transition Away From TTY Is Overdue.

It was well-established in PS Docket No. 11-153 (SMS Text-to-911) that use of TTY devices has significantly declined, with the deaf and hard-of-hearing community essentially migrating to SMS text-messaging over wireless networks in lieu of TTY. Telephone Relay Services and IP Relay Services (collectively, “TRS”) are also available to assist deaf and hard-of-hearing individuals in communicating with others, including 9-1-1.²

¹ BRETSA is a Colorado 9-1-1 Authority which establishes, collects and distributes the Colorado Emergency Telephone Surcharge to fund 9-1-1 service in Boulder County, Colorado. BRETSA representatives with experience in PSAP operations were unable to review and approve these Comments prior to the July 11, 2016 due date as a result of the Cold Springs Fire near Nederland, Colorado, which started on July 6 and was not fully contained until July 14th. BRETSA requests these Comments be accepted out-of-time, or accepted as Informal Comments.

² TRS apparently lack the ability to identify caller locations and the PSAP serving a caller location, as discussed in more detail in Section V and footnote 23 hereof.

In the context of 9-1-1, PSAPs are required by the U.S. Department of Justice to have TTY devices or interfaces to enable receipt of TTY calls to 9-1-1.³ However none of the current managers of the PSAPs supported by BRETSA can remember the last time their PSAPs received a TTY 9-1-1 call, and representatives of other Colorado PSAPs have stated that they do not believe their PSAPs have received a TTY 9-1-1 call in the past 15 years.

On the other hand, prior to the release of the NPRM in PS Docket No. 11-153, the Denver, Colorado PSAP obtained two smartphones for the purpose of receiving emergency text messages from deaf and hard of hearing individuals. The Denver PSAP published the telephone numbers to the deaf and hard-of-hearing community in the Denver area. Each phone is assigned to a dispatcher on each shift, who is responsible for handling text-messages to the PSAP as well as answering 9-1-1 calls. The Denver PSAP has reported that deaf and hard-of-hearing individuals have used these smartphone numbers to report emergencies from as far away as Grand Junction, Colorado, and it has relayed the messages by phone to the PSAPs serving the “caller’s” location.⁴ Thus, the deaf and hard-of-hearing community and PSAPs serving larger populations of deaf and hard-of-hearing individuals have already moved beyond TTY.

Nevertheless, PSAPs continue to maintain TTY devices, or TTY interfaces which are built into their 9-1-1 phone systems or computer-aided dispatch (“CAD”) systems, and continue to train their personnel on the use of these systems and interfaces. It is likely that federal and state initiatives to make broadband service as ubiquitous as exchange telephone service once was, coupled with provider decommissioning of copper exchange service plant, will lead to the sunset of exchange telephone service and obsolescence of TTY devices and service.

³ 28 C.F.R. §35.162 (“Telephone emergency services, including 911 services, shall provide direct access to individuals who use TDD's and computer modems.”)

⁴ The Denver PSAP is maintaining these smartphones, the numbers for which many in the deaf and hard-of-hearing community are familiar, even though it has implemented text-to-911.

The sunset of TTY support requirements should *not* be based on TTY market penetration *nationally*. TTY support requirements for providers and PSAPs should be based upon TTY market penetration, and *use*, in their service areas or jurisdictions, respectively.⁵ Service providers should be permitted to terminate their support for TTY within a service area by demonstrating (i) the provider does not offer *exchange* service in the area, and (ii) the provider offers SMS text-to-911, RTT and/or other alternatives to TTY.

BRETSA notes that during consideration of a 2014 Colorado House Bill which largely deregulated telecommunications in the state, AARP presented witnesses who addressed various extant assistive and health- and medical-related technologies which function with analog exchange service but not digital IP connections. It may thus be appropriate for the Commission and states to consider continued reliance of such devices on exchange services in considering applications for decommissioning exchange facilities and termination of exchange services. Grant of such applications might be conditioned upon provider implementation of equipment exchange programs, adapters permitting such devices to operate over digital networks, “to keep their customers whole.”

A PSAP should be permitted to terminate support for TTY upon demonstrating that (i) no providers supplying service within its jurisdiction are supplying exchange telephone service, or (ii) that it has not received a TTY call in 5 years, it supports SMS text-to-911, and TRS is available in the jurisdiction for individuals who may still use TTY.⁶

⁵ TTY devices are reportedly large and bulky, not very portable, and pose compatibility problems for CMRS providers. It may thus be that a percentage of the deaf and hard-of-hearing individuals who continue to possess or use TTY devices in their homes, also use CMRS devices and services.

⁶ The Commission should seek to establish in the record the level of TTY use on a portable basis, and thus whether the elimination of TTY support in a jurisdiction would be likely to impact deaf and hard-of-hearing individuals in other jurisdictions.

II. True SMS Text-Messaging Capability Remains Essential.

In the NPRM, the Commission states that a disadvantage of SMS text-messaging is that text messages may be delayed, received out-of-order, or not received at all; notwithstanding the demonstrations by Intrado⁷ and the University of Colorado Interdisciplinary Telecommunications Program (“CU-ITP”) in PS Docket No. 11-153 that these errors are unlikely to occur.⁸ The Commission does not address in the NPRM the *advantages* of SMS text-messaging over RTT, and the *disadvantages* of RTT.

A. Advantages of True SMS Text-Messaging to 9-1-1.

1. High Volumes of SMS Text-Messages May Be Delivered During Periods of Network Congestion.

True SMS text-messaging involves the transmission of individual text messages over a control channel, with approximately 300 text messages occupying the same bandwidth of a single minute of voice communications. In its September 2, 2011 NPRM in PS Docket No. 11-153, the Commission noted news reports that in the aftermath of the August 23, 2013 East Coast earthquake [voice] cellphone service was impaired while SMS and e-mail did not experience service disruptions. Facilitating the Deployment of Text-to-911 and Other Next Generation 9-1-1 Applications (Notice of Proposed Rulemaking in PS Docket Nos. 11-153, 10-255), September 2, 2011, Para. 40 at 15-16 (Available at <https://ecfsapi.fcc.gov/file/7021748584.pdf>.)

⁷ Intrado demonstrated that modification of the SMS system could overcome these concerns. December 12, 2011 Comments of Intrado Inc. in PS Docket Nos. 11-153, 10-255, at 5-10 and Attachments B and C. (Available at: <https://ecfsapi.fcc.gov/file/7021750446.pdf> (Comments), <https://ecfsapi.fcc.gov/file/7021750448.pdf> (Attachment B), <https://ecfsapi.fcc.gov/file/7021750449.pdf> (Attachment C)).

⁸ December 12, 2011 Comments of the University of Colorado, Interdisciplinary Telecommunications Program in PS Docket Nos. 11-153, 10-255, at 2-3, 5-10 (Available at: <https://www.fcc.gov/ecfs/filing/6016877950/document/7021750485>.)

2. SMS Text-Messages Can Be Successfully Transmitted From Locations Where There Is An Insufficient Signal Level For A Voice Call.

The CU-ITP demonstrated in its December 12, 2011 Comments in PS Docket No. 11-153 that an SMS text-message may be transmitted from locations far beyond the distance from a CMRS tower at which a voice connection can be made. CU-ITP Comments at 3, 11-12. This is supported by anecdotal evidence including snowmobilers, mountain climbers and others in the Colorado backcountry and other wilderness and mountainous areas, who have been able to make contact with PSAPs, friends or relatives by text message and effectuate their rescue, when a voice cellphone call was not possible. There are areas where owners of mountain cabins, ski chalets, or vacation homes do not invest in wireline service, are unable to make or receive wireless voice calls, but rely on SMS text-messaging for communications with friends, family and business associates.

BRETSA understands that the ability of SMS text-messaging beyond the usable coverage area of CMRS voice is due to (i) the simplex transmission of individual SMS text messages as a single and brief transactions, (ii) the fact that a wireless device will continue to try to send an SMS text-message until the message is received, (iii) the variability of signal strength across even small distances, and (iv) the fact that the signal must reach the required level to transmit the signal only for the very brief period of time required for the small amount of data included in an SMS message to be transmitted. This is not only important for residents of BRETSA's jurisdiction, which climbs from the high plains of Colorado to the Continental Divide. AARP presented witnesses against a 2014 Colorado House Bill which largely deregulated telecommunications service in Colorado, who testified that they are not able to place wireless voice calls in certain areas or on certain sides of their apartment or office buildings, and thus continue to require wireline service for voice calls. The inability to establish an adequate

connection for a voice is not limited to rural areas, but also occurs in urban and suburban environments, although some devices are able to alternatively transmit voice calls via WiFi connections (which are much more common in urban and suburban areas and non-existent in many remote areas), if an open WiFi connection can be accessed.

BRETSA has previously expressed concern that as wireless providers transition to LTE-IMS, and will provide only emulated SMS text-messaging, the capability of true SMS text-messaging to allow individuals to communicate (and reach 9-1-1) from locations beyond the areas within which they can make a voice call will be lost. John Snapp of Intrado (now West Safety Services) has opined that there will still be a difference in the distance at which voice and text communications could be completed in an LTE-IMS environment, but it will only be a very slightly increased distance from which emulated SMS text messages could be transmitted. BRETSA is concerned that the effective service areas of RTT, requiring establishment of a “session,” will also be limited to the voice service coverage areas of CMRS providers.

3. SMS Text-Messaging Supports Multitasking.

While the number of automobile (and other) accidents attributable to text-messaging might suggest otherwise, SMS text-messaging supports multitasking. (It is driving that does not support multitasking.) The “latency” of text communications as a party to a text-messaging conversation waits for the other party to the exchange to read, respond to and transmit a message, allows the party to devote their attention to other matters. It is not unusual for an individual to carry on multiple text-message conversations simultaneously. Commercial websites use text messaging-like applications to allow a single customer support representative to handle multiple customer support sessions. The customer support representative reads and responds to one customer’s current message while other customers are reading and responding to the representatives most recent response.

In the 9-1-1 context, PSAP personnel can quickly scan text-to-911 messages, and prioritize those which concern the most urgent incidents. PSAPs report that their personnel are able to handle text messages while also handling a voice call.⁹

B. Disadvantages of RTT.

1. RTT Coverage Areas May Not Meaningfully Exceed Voice Coverage Areas.

BRETSA understands that RTT requires establishment of a “session,” and a persistent duplex connection between the user device and the network, the same as voice calls in a digital environment. As a result, RTT coverage areas, like emulated SMS in an LTE-IMS environment, will not meaningfully exceed voice coverage areas. If this understanding is correct, a transition to RTT would mean that some BRETSA constituents who reside in the canyons immediately west of the City of Boulder, throughout the mountainous areas of the County, and in other areas where they might receive an insufficient signal to maintain a SIP connection, would be unable to establish an RTT connection to the PSAP.¹⁰ Even if RTT is “compatible” with SMS text-messaging, that compatibility is likely to be limited to the message format and not to the transmission characteristics of SMS which make it robust.

2. Users May Prefer Exchange Of Complete Messages To Character-by-Character Message Transmission.

It is not clear that consumers will choose to use RTT. While the ability to watch every letter of another party’s message appear has been described as an advantage of RTT, making the communication more fluid and natural; it would also eliminate the multi-tasking advantages of

⁹ Currently, most PSAPs which have implemented SMS text-to-911 report receiving relatively few messages (only a small percentage of which are from deaf or hard-of-hearing individuals), with many messages addressing non-urgent matters.

¹⁰ While the Commission states that RTT is compatible with text-to-911, this may mean that RTT messages are not transmitted character-by-character, but are held and transmitted as a complete message. If providers transition to LTE technologies and eliminate the control channels over which true SMS text messages are transmitted and the modulation techniques by which true SMS text messages are sent, then true SMS and its advantages will be unavailable.

SMS text-messaging. As stated above, individuals using SMS text-messaging are known to carry on multiple text-message conversations at a time, and to engage in SMS text-messaging while engaging in other activities. Reviewing RTT messages arrive on a character-by-character basis would require an RTT-participant's constant attention, and eliminate this capability. Parents may well wish to disable the their teenaged children's devices RTT capabilities because they would make "texting-while-driving" even more hazardous an activity than it already is.

Other consumers may simply find it boring to watch a message arrive character-by-character. The duplex nature of RTT enabling users to message each other simultaneously, can result in parties responding to portions of messages before senders have completed their full thoughts, and the "conversation" becoming fragmented and confusing. This would be particularly likely if a party to an RTT conversation was unable to know when the other party (another party) had finished his or her thought. With voice communications, inflections as well as pauses (a party stops speaking) indicates that the party has finished his or her thought. With text messages, the transmission of a message generally indicates a completed thought. With TTY, a participant types GA for "Go Ahead" to signal the other party to start their response. Duplex text-messaging applications tend to lack any of these cues as to when one party has finished their thought, and it is the other party's turn to "speak." Users simply may not appreciate the inability to complete their thought by RTT before the person with whom they're communicating begins responding. In a spoken conversation context, it would be considered rude for someone to start talking before the person to whom they're responding had finished speaking, or completed their thought.

C. Advantages and Disadvantages of RTT For PSAPs.

1. PSAPs Can Obtain Critical Information More Quickly With RTT Than With SMS Text-Messaging.

In the PSAP, dispatchers commonly answer voice 9-1-1 Calls “9-1-1, what is your location,” or “9-1-1, what is your emergency.” The *location* and *nature* of an incident are the two critical pieces of information necessary for a PSAP to dispatch the appropriate First Responders, and are the first items of information needed. With SMS text-to-911, dispatchers must await completion, transmission and receipt of a “caller’s” first text message before they even know the caller is contacting the PSAP, and can ask these key questions.

As a result of the duplex nature of RTT, a dispatcher will know immediately when a “caller” initiates an RTT session with the PSAP. The dispatcher will not need to wait for the caller to complete and send his or her initial message, but can immediately respond to ask for the most critical information required for emergency response.

2. PSAPs Are Not Ready To Transition To RTT.

Not all PSAPs have yet deployed *even* SMS Text-to-911. Those that have are still gaining experience with that technology. The low number of SMS Text-to-911 calls, and particularly SMS Text-to-911 calls from deaf and hard-of-hearing individuals even in more highly populated jurisdictions, together with the fact that some PSAPs have not received a TTY call in over a decade, may make deployment of SMS Text-to-911 appear less urgent to some PSAPs. Some PSAPs which have deployed Text-to-911 have reported that few of these calls have involved emergencies; most have concerned non-emergency matters, and only a very small percentage have been from people who could not have easily and safely placed a *voice* call to 9-1-1.

PSAPs which have not yet deployed SMS Text-to-911 capability may be in the process of evaluating options for receiving text-to-911 messages, and the TCC from which to obtain

service. PSAPs may be developing protocols and dispatcher training for handling text-to-911 messages, and addressing issues such as chain of custody, and budgetary requirements. Some PSAPs may yet fear that they will be overwhelmed by text messages.

Whether or not PSAPs have yet implemented text-to-911, it is too soon for the majority of them to transition to RTT. Text-to-911 is not yet ubiquitous, or even nearly ubiquitous. Until it is, its full effect will not be known. In addition, text-to-911 may be more important than RTT for the reasons discussed above, including the ability to transmit messages from locations at which there would be an insufficient signal for voice and RTT calls to be connected.

3. RTT Limits Multitasking As Compared To SMS Text-Messaging.

PSAPs which have implemented text-to-911 are finding that SMS text-to-911 messages do not overly burden them. With the latency of SMS Text-to-911, the dispatchers are able to multitask and handle the text-to-911 calls while handling voice calls, or to handle multiple text-calls at a time. In the case of multiple text-to-911 calls, dispatchers are able to scan the messages and prioritize those which are more urgent.

It is unclear to BRETSA whether PSAPs will handle RTT sessions similar to the manner in which they handle SMS Text-to-911 messages, waiting for the caller to complete a message (thought), and then read and respond to it; or will watch the message arrive character-by-character and respond before the caller has completed his thought. On the one hand, dispatchers may already be multi-tasking between 9-1-1 calls and dispatching First Responders, and seek to handle the RTT session as a typical SMS text-message and review and respond to each RTT message when it is completed. On the other hand, there is the ability to begin responding immediately to the caller to ask for the location and nature of the incident, and direct the caller to provide the information most relevant to determining the appropriate public safety response. There also does not appear to be any clear indication of when the caller has completed an RTT

message (thought), such as through tone or inflection with a voice call. If the dispatcher is multitasking and does not begin responding immediately after the caller completes his thought, the caller may begin a new message (thought), or wonder if the connection has been broken.

III. Any RTT Implementation Should Include Automatic Fall-Back to True SMS Text-Messaging.

In light of the foregoing considerations, BRETSA strongly urges the Commission to require that any RTT implementation provide for devices and systems to automatically fall-back to *true* SMS text-messaging¹¹ in cases where (i) a SIP session cannot be established, whether due to inadequate signal strength or system loading, (ii) the service provider does not yet support RTT, (iii) the PSAP does not support RTT, or (iv) the PSAP has temporarily suspended or limited RTT sessions or such sessions are blocked, due to spikes in call volumes.¹² Ideally, however, if an RTT connection to the service provider was possible or temporarily established, the superior location information available with RTT would be utilized for call routing and caller location when the RTT implementation “fell-back” to true SMS-text.

IV. PSAPs Should Not Be Required To Support All RTT Formats.

The NPRM asks whether simultaneous RTT with voice (“Voice Carry Over” or “VCO” and “Hearing Carry Over” or “HCO”), and RTT with video or other multimedia, should be required as part of the Safe Harbor RTT standard.¹³ In PS Docket No. 11-153, some commenters

¹¹ The term “True SMS” is used to differentiate SMS as provided through a separate channel such as a control channel, and not requiring establishment of a persistent “session,” from emulated SMS in an LTE-IMS type environment.

¹² Suspending or limiting RTT sessions may well result in more expeditious emergency response. With SMS text-to-911, dispatchers are able to scan multiple message streams, quickly identify the more urgent messages, respond to those messages and or dispatch First Responders; while deferring response to a less urgent message to a later time. For example, several years ago when a wildfire broke out in the early morning hours on a mountain overlooking the City of Boulder, the BRETSA PSAPs continued to receive calls reporting smoke and that there was a fire on the mountain late into the afternoon, hours after the wildfire has started and first been reported, units had responded, evacuations had been ongoing, and the smell of smoke had permeated the City. These are examples of calls or text messages which would be a low priority for response.

¹³ The more capabilities added to a standard, the less it appears a “safe harbor” standard.

sought the ability for deaf and hard-of-hearing individuals to communicate with PSAPs by Sign Language over video, and even stated that every PSAP should have available a pool of sign language-qualified call-takers to handle such calls. However it is simply unrealistic to expect that every PSAP can employ individuals with these qualifications as well as the other skills required of PSAP personnel.

Just as the PSAP for the City of Denver, which is home to several schools for the deaf and a notable deaf population, obtained smartphones and published the numbers to the deaf and hard-of-hearing community for the purpose of allowing text messages to the PSAP well before the Commission adopted its NPRM in PS Docket 11-153 proposing text-messaging to 9-1-1; BRETSA anticipates that PSAPs serving communities with significant deaf and hard-of-hearing populations will be early adopters of RTT and may implement VCO, HCO or even video sign language capabilities. One- and two-position PSAPs serving sparsely populated areas, and even mid-sized PSAPs which have not received a TTY call in years, may not be early adopters of such additional formats of RTT. They will face impediments to implementation, and may not be able to sustain the costs of RTT based upon the limited demand for the services.

It is widely accepted in the industry that only approximately two percent of people are qualified to serve as Telecommunicators.¹⁴ Everyone understands that a dispatcher position is a very high stress job, because of the nature of the calls they receive. In addition, often, dispatchers rarely learn the outcome of the incidents for which they take calls or dispatch First Responders. They never learn whether the toddler who fell into the pool, or the man who collapsed shoveling

¹⁴ In most PSAPs, personnel both take 9-1-1 calls and dispatch First Responders. In some PSAPs, mostly larger PSAPs, personnel are cross-trained as “calltakers” and “dispatchers,” but are assigned only one function on any shift. PSAPs which are able to employ personnel to function separately as call-takers and dispatchers find it beneficial to reduce the level of multi-tasking so that personnel are not *both* taking calls, and dispatching First Responders based on those calls. Separating the functions also eliminates the risk of callers overhearing what the dispatcher is telling First Responders about their call. While the term “Telecommunicator is an apt one for calltakers, dispatchers and calltakers-dispatchers, and emphasizes the importance of their communications skills; BRETSA will use the term “dispatcher” herein to refer to all three categories of PSAP Telecommunicator.

snow was revived, etc. The dispatcher is already handling the next call, or the next, before the outcome is known, and it may be known only to the doctors at the Emergency Room to which the subject of the call was transported.

Beyond the inherent stress, however, the position also requires a unique skill-set. A dispatcher must be a good communicator, both in obtaining information from callers to 9-1-1 and providing information to First Responders, as well as providing instructions or information to callers. A dispatcher must have good short-term memory, *and also* good long-term memory. A dispatcher must have situational awareness, and be comfortable working with technology so that entering data in a CAD system and retrieving information from databases is “second nature” and does not require the dispatcher to stop and think about how to use the technology. A dispatcher must act accurately and quickly, because lives and property are at stake and seconds count. Dispatchers must also be willing to do shift work, at a rate appropriate to an agency’s budget and overall compensation structure.

Even though Colorado has legalized marijuana use, recent use of marijuana, a record of irresponsible use of alcohol or legal drugs, or use of illegal drugs would disqualify an individual from employment at the BRETSA-supported PSAPs. A dispatcher’s faculties and performance must remain unimpaired.

When people call 9-1-1, they are often excited, speak rapidly, and may use regionalized pronunciations. A dispatcher should be able to accurately comprehend the information being relayed by the caller, recognize and direct the caller to provide relevant information, and simultaneously enter the information provided into the CAD system. The dispatcher must have the communications skills to enter the information in the CAD system and relay it to First Responders in a concise and clear manner. They must be able to extract the information critical

to Emergency Response from the often excited and disjointed presentation of a caller, and on-the-fly distill it down to a clear and readily understandable statement.

Dispatchers must have situational awareness of calls and incidents being addressed by other dispatchers and by First Responders; to appreciate whether a call concerns an incident which has already been reported or a new incident; and if an incident has already been reported, whether new information relevant to the Emergency Response is provided. Dispatchers monitor general dispatch radio traffic and tactical group traffic to maintain situational awareness and anticipate First Responder needs. In dispatching First Responders, dispatchers should know which First Responder units are on duty and available for dispatch to an incident, their general beats or location to determine which units can reach the scene of the incident the soonest and should be dispatched, and they should also know the equipment and skill sets of the units for dispatch purposes (although some modern CAD systems now use this same information to recommend units for dispatch).

During a 9-1-1 call, a dispatcher will ask the caller for the same information in different ways, and restate information provided to confirm its accuracy with the caller. It's not unusual for a caller to provide an old address or phone number during the stress of an incident and 9-1-1 call. The dispatcher should be able to remember the information previously provided to test against a second response, without the delay attendant in looking up the information previously provided and entered. There may be many calls which involve a caller providing a telephone number, license plate, address, or similar information, and a dispatcher must be able to remember the information provided during the current call accurately, without confusing it with similar information which may have been provided in the call or earlier on a different call.¹⁵

¹⁵ See the transcript of a February 27, 2013 9-1-1 call to the Longmont, Colorado PSAP, "Suicide by Semi" submitted as Exhibit No. 1 hereto, for an example of a 9-1-1 call. The audio recording of this call is available on the

Good long term memory is also important for a dispatcher. The manner in which a call should be handled, the call process and questions to ask for a type of call, the units to dispatch based on the type of incident (*e.g.*, automobile accident with injuries, structure fire, grass fire, domestic violence complaint), are based upon the business rules of the PSAP and of the agency which would respond to the call, as well as upon state law and local ordinances of the jurisdiction involved.¹⁶ The information reported by a caller and the applicable codes and business rules will determine whether a dispatcher (i) sends First Responders speeding to the caller's (or some other) location, lights flashing and sirens blaring, (ii) sends civilian volunteers to the caller's location to take a report, or (iii) directs the caller to fill out a report online or at a police station, for example. Dispatchers don't have time to refer to a written copy of these business rules and the applicable codes every time a call is received, but must learn them and respond appropriately to each call without delay.¹⁷ Telecommunicators do not "freelance" the handling of 9-1-1 calls, based on their own ideas of what might be best.

Dispatchers must also be familiar with the various IT systems used or accessible by the PSAP, the radio systems and channel assignments used by the PSAP and agencies they dispatch. Dispatchers must know how to handle units which respond into a neighboring jurisdiction, as well as units from a neighboring jurisdiction or the State Police which respond into their

website of the 9-1-1Colorado Foundation, at <http://911colorado.org/911-audio-videos/other-911-calls/>. Last names, street addresses, the last four digits of telephone numbers, and identifying information regarding individuals involved in other incidents which can be heard in the background of the call, have been deleted from the transcript and recording. The recording may not be consistent with the call times included in the transcript due to the deletion of this information from the recording.

¹⁶ The City of Boulder and City of Longmont PSAPs supported by BRETSA dispatch the city fire and police departments and a commercial ambulance company. The CU Boulder PSAP dispatches University Police. However the Boulder County PSAP dispatches the Sheriff's Department, 5 police departments, and 21 fire departments or districts, as well as a commercial ambulance company.

¹⁷ The exception is Emergency Medical Dispatching, or "EMD," in which a dispatcher goes through a series of questions with the caller in a decision-tree with a caller to diagnose an ill or injured individual, and then provide instructions in First Aid by telephone. The EMD systems can be card-based or computer-based, and are developed with input from medical experts. Many agencies adopt an EMD system only after review and possible modification by a local doctor retained by the agency (some Colorado PSAPs need to address altitude sickness in their EMD systems, while coastal communities may need to jellyfish stings, for example).

jurisdiction.¹⁸ They must be able to retrieve data from FBI and state bureau of investigation databases, CopLink or similar databases, retrieve call recordings and write them to disk for prosecutors or defense attorneys, prepare and launch ENS alerts, and perform many other tasks using PSAP or other public safety IT systems.

Dispatchers may also need to be able to coordinate “move-ups,” where fire or other First Responder units are pre-positioned to respond to alarms from an area covered by a fire station, the units from which have already been dispatched to incidents.

It is against this backdrop that PSAPs have been wary of or slow to implement SMS text-to-911. Implementation does not merely require establishment of an Internet connection available for web access to text-to-911. The decision has to be made to implement text-to-911, the method of receiving text-to 9-1-1 messages, and the TCC selected. Protocols for handling text-to-911 messages must be developed and approved, and dispatchers trained on the protocols. These steps must be taken by managerial or supervisory personnel in the busy PSAP and/or agency, in addition to the regular responsibilities of these personnel. Systems may have to be acquired or upgraded, network connections established and systems and network security addressed. Additional data storage capacity and or network capacity may be required and other implementation requirements addressed and budgeted for. Compliance with laws, including open records acts, and non-disclosure requirements such as those pertaining to certain types of victims and perpetrators must be addressed. Court and evidentiary rules such as those pertaining to chain of custody must be considered.

¹⁸ This discussion gives an overview of the qualifications and capabilities required of Telecommunicators. See, also, Exhibit No. 2 hereto, which includes a recent job posting by the City of Boulder PSAP for a Telecommunicator position, and Exhibit No. 3 hereto, descriptions of the CritiCall pre-employment skills-test modules for Telecommunicator positions. The BRETSA-supported PSAPs each use select CritiCall modules in their candidate evaluations.

At the same time that PSAPs must follow processes and address issues for implementing new systems, many PSAPs are almost constantly understaffed due to stress-related turnover and leave, and the length of training before a new dispatcher should staff a position by themselves. (It is not unusual for only 1% of respondents to a PSAP job notice to make it through the evaluation process and be hired, and 50% or more of those hired fail to complete training.)

Requiring PSAPs to now transition to RTT when they have only recently implemented, are implementing or considering implementing text-to-911 (which includes multimedia attachments downloadable from at least one of the TCCs), is simply asking too much of PSAPs and PSAP personnel. It is unrealistic to expect PSAPs to implement a new text technology so quickly on the heels of implementing SMS text-to-911. For the reasons discussed above, (i) SMS text-to-911 will be more universally available through the necessary transition period for implementation of RTT, (ii) SMS messages can be sent from locations in which a user-device will be unable to establish a SIP session, and (iii) there are reasons to believe that end users may continue to prefer SMS-type text-to-911 to RTT.

As discussed above, to date PSAPs which have implemented SMS text-to-911 have generally found that the volume of text-to-911 “calls” do *not* overwhelm their resources. Dispatchers can multitask the handling of SMS texts to 9-1-1 *while* they are handling voice calls, and other text messages. This will not be the case with RTT if dispatchers are to watch the RTT messages arriving character-by-character, as the Commission presumes will occur. Thus, RTT could have a different impact on PSAPs than SMS text-to-911 has had to date.

PSAPs with the resources to implement RTT and a constituency which will benefit from the service, will be early adopters of RTT. PSAPs which are not ready or lack the resources or demand to implement RTT, must *not* be required to do so. First Responder agencies and PSAPs

will reasonably act to meet the needs of their constituents, as best they can. As a matter of comity, the Commission should respect the judgments of local public safety agencies and PSAPs based upon their experience in the field and superior knowledge of local public safety needs.

It is even more unrealistic to expect PSAPs to employ dispatchers with sufficient sign language proficiency to accurately understand the sign language-over-video communications of someone who is deaf or hearing impaired, highly proficient in sign language, and in an excited state due to the public safety incident which prompted the 9-1-1 call. Adding sign language proficiency to the required qualifications for a dispatcher would only make more difficult the recruitment and retention of qualified applicants.

BRETSA notes that the last time a BRETSA PSAP retained the services of a certified sign language interpreter, in connection with a tour of the PSAP by a representative of the deaf and hard-of-hearing community, the certified interpreter charged a rate of \$45 per hour, portal-to-portal. Hourly rates for sign language interpreters in the Denver Metropolitan Area range from \$32 to \$50 per hour.¹⁹ The rates charged by qualified sign language interpreters would make the employment of such interpreters unaffordable for many PSAPs, particularly given the small number and low frequency of TTY calls and SMS text-to-911 calls received from deaf and hard-of-hearing individuals by many PSAPs.²⁰ PSAPs located outside of urbanized areas may have greater difficulty locating qualified sign language interpreters with the other required skills of a dispatcher, at any price.

¹⁹ BRETSA notes that in assignments of more than one hour, two or more sign language interpreters are often provided and work in 15-20 minute shifts to reduce the potential for Repetitive Stress Injuries and mental fatigue, and because the quality of interpretation begins to decline after 40-minutes.

²⁰ We note that PSAPs funded by BRETSA offer increased compensation to multi-lingual dispatchers; yet the PSAPs face continued difficulty in recruiting multi-lingual dispatchers. Pay differentials and increases in compensation for certain public safety job descriptions can of course result in personnel issues, and impact overall pay scales for different job descriptions, having a greater impact than might otherwise be anticipated.

Also because of the low number and frequency of such calls received by many PSAPs, and thus the anticipated low number and frequency of video sign language calls (with or without RTT text-over video); even if a PSAP were to provide dispatchers with sign language training, it may be difficult for them to develop and retain a high level of proficiency if only a few or no such calls are received over extended periods. Moreover, there are several “dialects” of sign language, including ASL, English Sign, Pidgin and several others. Even individuals who communicate via ASL use a unique syntax and word order which may be confusing to dispatchers. In summary, dispatchers who are selected for a specific and uncommon skill set, and assigned demanding and stressful job requirements, cannot possibly be expected to maintain a sufficiently high level of proficiency in one, let alone several, sign language dialects to be able to readily and accurately understand the excited signing of a deaf or hard-of-hearing person during a stressful public safety incident, possibly transmitted via cell-phone video.

Dispatchers also need to enter the information provided by callers into CAD systems, making the information available to other dispatchers and increasingly to First Responders via Mobile CAD. It is unclear that a dispatcher would be able to both engage in a video sign language conversation with a caller, and make keyboard entries of the information provided by the “caller” into the CAD system, as expeditiously as demanded by the emergency circumstances which prompted the call.²¹

Very large PSAPs and PSAPs serving large deaf and hard-of-hearing communities will continue to take practical steps to improve their capabilities of serving these communities.

²¹ In PS Docket No. 11-153, some commenters also suggested that requiring PSAPs be video-sign language capable would also provide employment opportunities for the deaf and hard-of-hearing. In addition to needing to meet the other qualifications for a dispatcher position, which only about 2% of people have, a dispatcher must be able to effectively handle voice calls (since the vast majority of 9-1-1 calls are voice calls), monitor radio traffic to maintain situational awareness, and communicate the information provided by callers (including sign language callers) to First Responders by radio as well as through Mobile CAD. Information must be relayed quickly and accurately in emergency situations, when seconds count.

However, for the vast majority of PSAPs, implementation of RTT before or soon after implementation of SMS text-to-911, and implementation of video sign language capabilities, with or without RTT-over-video, is not feasible, economically or otherwise. Where PSAPs receive no or few sign-language-over-video calls, the ability of trained dispatchers to maintain proficiency at sign-language will be problematic.

V. There Is A Continuing Role for Relay Services.

The Commission has suggested that the deployment of RTT may reduce the need and demand for Relay Services. Whether or not it reduces need and demand generally, there will continue to be a demand for Relay Services for deaf and hard-of-hearing individuals contacting 9-1-1 other than via TTY or text-messaging. As demonstrated above, it is unrealistic to expect the great majority of PSAPs to provide sign language-over-video capabilities, with or without RTT support. Few, if any, PSAPs will receive sign language-over-video calls frequently enough for dispatchers to maintain sign language proficiency. But aggregating all video sign language calls to 9-1-1 for all PSAPs and routing them to a Relay Service regularly handling video sign language calls would provide a practical solution.²²

BRETSA appreciates the challenges in the use of Relay Services for 9-1-1 calls. The first is the delay inherent in the caller connecting to the Relay Service, which must then connect to the PSAP. This is similar to the delay which results when a non-English speaker calls 9-1-1, and (i) the PSAP has to conference-in a Language Line-type translation service, (ii) that service has to

²² The DOJ's requirement in 28 C.F.R. 35.162 that "Telephone emergency services, including 911 services, shall provide direct access to individuals who use TDD's and computer modems," precludes access through a third party or relay service. *Chatoff v. City of New York*, 1992 U.S. Dist. LEXIS 21662 (S.D.N.Y. June 26, 1992). *The Americans with Disabilities Act: Title II Technical Assistance Manual*, Nov. 1993 & 1994 Supp., II-7:3100 at 42 (Available at <https://www.ada.gov/taman2.html#II-7.3100>) ("State and local agencies that provide emergency telephone services must provide "direct access" to individuals who rely on a TDD or computer modem for telephone communication. Telephone access through a third party or through a relay service does not satisfy the requirement for direct access."). Where direct access is provided via TDD and/or SMS or RTT text, BRETSA submits that access through a relay service for sign language-over-video should be acceptable with automatic NG9-1-1 connection to a Relay Service, for the reasons stated herein.

determine the language and dialect the caller is speaking and (iii) get the appropriate interpreter on the line. In the context of a call to 9-1-1 via a Relay Service, the call is first made to the Relay Service, which does not have the systems or the information available to determine the caller's location and the PSAP to which the call should be routed.²³ This delays connection of the call to the PSAP and Emergency Response. Second, with legacy 9-1-1, the calls would also come into the PSAP from the Relay Center over administrative lines rather than the 9-1-1 trunks, which connect to the call logging system, PSAP 9-1-1 telephone system and CAD system, and are answered on a priority basis. NG9-1-1 may provide a solution to these challenges.

Several years ago, when NG9-1-1 was first being discussed, a presentation was made to the Colorado 9-1-1 Task Force in which the presenter explained that with NG9-1-1, an end-user's profile they entered into their wireless phone would include the user's language preference. If a caller's device-profile indicated they spoke German, for example, that information would be included in the protocols of a 9-1-1 call, and the call would be automatically routed to a dispatcher in the PSAP serving his location (the "Serving-PSAP") whose profile indicated they spoke German. If there was no such dispatcher in the Serving-PSAP, the call would be routed to a dispatcher anywhere whose profile indicated they spoke German, who would handle the call and forward the information reported to the Serving-PSAP.²⁴

²³ In Comments filed in PS Docket No. 11-153, Krystallo Tziallila, a deaf woman, described her attempt to reach 9-1-1 through a Relay Service after being involved in an auto accident, and the Relay Service CA's inability to determine her location, determine the PSAP serving her location and to connect the call to that PSAP. See December 14, 2011 Informal Comments of Krystallo Tziallila in PS Docket No. 11-153 (available at <https://ecfsapi.fcc.gov/file/7021750686.pdf>). It is no wonder that the deaf and hard-of-hearing community and DOJ consider the use of Relay Services an inadequate and unreasonable substitute for direct access to a PSAP via TDD, given that Relay Services lack the systems or training to locate a caller and connect the call to the correct PSAP via 9-1-1 trunks.

²⁴ The challenge presented by this proposal, is that a Telecommunicator in a PSAP other than the Serving-PSAP does not have access to the incidents which have already been reported to the Serving PSAP and are being responded to, available units to respond to new incidents, or the business rules and applicable codes in the Serving PSAP and its jurisdiction. This would significantly limit the ability of the remote PSAP to effectively handle the call.

BRETSA believes a much better formulation in the case of a non-English speaker is for the call to be transmitted to the Serving-PSAP, but the appropriate interpreter at a Language Line-type service conferenced-into the call during call-set up, based upon the caller's language preference entered in his user profile on his phone. This would reduce the time necessary to identify the language and dialect being spoken by the caller and get the appropriate interpreter on the line, *from minutes to milliseconds!*²⁵

In the context of a 9-1-1 call from a person whose profile entered in their device indicates that they are deaf or hard-of-hearing, and would prefer to communicate with 9-1-1 via sign-language-over-video; the caller would *not* call the Relay Service (which would then have to try and identify the Serving-PSAP without any ALI data available, and then place a call to the PSAP which might arrive over admin lines, and after some delay) as at present with any 9-1-1 call to a Relay Service. The deaf or hard-of-hearing person would instead call 9-1-1. The call would be routed to the NG9-1-1 Data Complex which would determine from the user's profile information the preference to communicate by sign language over video.²⁶ During call-setup, the Data Complex would conference-in Communications Assistant ("CA") qualified as a sign language interpreter at a Relay Service. The call would be routed to the correct PSAP based upon the ALI (PIDF-LO) data transmitted with the 9-1-1 call, and the Video Relay Service would not have to try and divine the caller's location from information provided by the caller (delaying connection of the call to a PSAP). The NG9-1-1 Data Complex would connect the call to a Relay Service

²⁵ These are the types of improvements which NG9-1-1 can provide which will make a real difference in the effectiveness of 9-1-1 and public safety response, rather than the highly-touted ability of lay persons to transmit pictures or videos to the PSAP which they (the lay person) think may be useful in an emergency situation. (BRETSA believes it is preferable for individuals to transmit photos or video to the PSAP only when requested by the dispatcher.)

²⁶ NG9-1-1 Data Complex is the term used by BRETSA to describe the aggregate functionalities of NG9-1-1, not a specific location at which functionalities are provided. An important characteristic of NG9-1-1 is that it enables distributed processing, so that many functionalities can be provided at multiple or alternative locations.

simultaneously with connection of the call to the PSAP. The call could be routed not only to a Relay Service, but to a CA trained and/or experienced in dealing with 9-1-1 calls.

Such an interpreter, regularly handling Relay Service calls, would be much more capable of communicating with the caller by sign language than even sign language-trained dispatchers who may only rarely receive such calls. The use of Relay Services in this manner would be akin to the manner in which larger PSAPs separate the call-taking function from the dispatch function, and the Relay Service CA would gather the necessary information from the caller, with the help of a dispatcher, and the dispatcher would dispatch the call.

This “Automatic NG9-1-1 Connection to Relay Service” approach would (i) connect a 9-1-1 call from a deaf or hard-of-hearing individual directly to a PSAP, so that ALI and ANI data would be available to the PSAP, (ii) connect the call to the correct PSAP without the delay of a Relay Center trying to determine the correct PSAP without ALI data, (the call would reach the PSAP via the ESInet with location information, and be connected into the various PSAP systems), and (iii) the call would be identified as a 9-1-1 call prior to connection to the Relay Service, so it could be directed to a Relay Service/Relay Service CA specially qualified or experienced to handle 9-1-1 calls. This would avoid (i) the delay inherent in a Relay Service trying to identify the caller’s location, identify the PSAP with jurisdiction to answer calls from and dispatch First Responders to that location; (ii) and the random assignment of the call to a Relay Service CA who may not be trained or prepared to handle a 9-1-1 call. It would also reduce the likelihood of a misunderstanding because the sign language-over-video call would be interpreted by a CA who routinely communicates by sign language and is expert in doing so, understands the syntax and word order of the sign language used. The Commission’s Rules also require, *inter alia*, that all CAs (i) be sufficiently trained to effectively meet the specialized

communications needs of individuals with hearing and speech disabilities, (ii) have competent skills in typing, grammar, spelling, interpretation of typewritten ASL, and familiarity with hearing and speech disability cultures, languages and etiquette, and (iii) are qualified interpreters able to interpret effectively, accurately, and impartially, both receptively and expressively, using any necessary specialized vocabulary. *See*, 47 C.F.R. § 64.604 (a).

BRETSA has not heard discussion of the potential configuration or use of NG9-1-1 in which calls would be routed or processed based upon the user profile entered in the user's device, subsequent to the presentation to the Colorado 9-1-1 Task Force. The significant improvement in the time required for a Relay Service to connect to the correct PSAP or the PSAP to conference-in the correct interpreter for a non-English speaker, would alone appear to justify such capability.²⁷

VI. A Basic, or Safe-Harbor, Standard For RTT Is Essential, But Should Not Include Every Possible Feature of RTT.

Establishment of a basic (safe harbor) standard for RTT is essential. PSAPs should not be put in a position of having to invest in different systems or standards to meet every flavor of RTT which might be implemented in user devices or over-the-top applications. The federal government and other governmental and non-governmental organizations should not be placed in the position of investing in distribution of devices for the deaf, hard-of-hearing and/or blind which may become obsolete if another standard prevails in the marketplace. Many deaf or hard-of-hearing individuals are unemployed or underemployed as a result of their disability, and have limited resources to obtain devices and services. They should not be put in a position of “gambling” on which standard will prevail in the marketplace. All of these considerations argue

²⁷ Transmission to a PSAP with a 9-1-1 call of certain types of information a user has entered into their profile on their device, may also improve public safety response for all users in other ways.

for a the Commission's adoption of a basic standard with which all RTT implementations must comply, and which will permit different RTT implementations to communicate on a basic level.

The more features that are included in this basic standard, the less it appears to be a basic or safe harbor implementation. More significantly, the less opportunity it affords for development and competitive selection of advances and features in the marketplace. It would also appear to enable manufacturers to offer only full-featured, high price units, rather than fostering introduction of units with varying feature sets at varying price points, so that a deaf or hard-of-hearing consumer could match the features and price to his needs and resources.

One feature which BRETSA believes should be included in the basic, safe harbor implementation of RTT, is automatic fall-back to and compatibility with *true* SMS text-to-911. This will enable text-to-911 communications (i) from locations from which an RTT session cannot be initiated, (ii) with devices which have inactivated RTT (including for purposes of limiting distracted driving incidents), and (iii) with PSAPs which have not yet implemented RTT or have temporarily disabled RTT to manage call volumes during a major incident. In the latter case, voice calls and other SIP sessions would likely be subject to blocking due to call volume, and SMS text-messaging might be the best option for people to contact the PSAP, and for PSAPs to prioritize calls based upon urgency of the caller's situation.

BRETSA understands that a capability of RTT to fall-back to *true* SMS text-to-911 under would require CMRS providers to continue to deploy and operate control channels, even if their use was solely to permit true SMS communications and was not functionally required for system operation. This seems a small burden on providers given the valuable licenses they hold to use a public resource, and the apparently unique ability of true SMS text-to-911 to transmit text messages well-beyond the CMRS voice and RTT coverage areas, and to transmit significantly

greater volumes of text messages than voice calls. The maintenance of true SMS text-messaging is critical because of the increased range at which true SMS coverage can be provided, and the increased ability of the public to contact 9-1-1 even when voice calls are blocked.^{28 29}

Respectfully submitted,

**BOULDER REGIONAL EMERGENCY
TELEPHONE SERVICE AUTHORITY**

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²⁸ As an alternative, the Commission might permit CMRS providers to jointly maintain an SMS network which users of any participating provider could use, with an aggregate coverage area equal to that which would be achieved through deployment of true SMS capability on each site of each provider. This would maintain the true SMS capability which can be vital when incidents result in overloading of the voice networks or voice capabilities, and when individuals are located beyond voice coverage areas. Indeed, SMS-only sites might be established in remote areas to extend the reach of 9-1-1 service.

²⁹ BRETSA is appending hereto at Exhibit No. 4, for the record in this proceeding, the Colorado 9-1-1 Task Force's Communications Subcommittee's Accessibility Report.

Exhibit No. 1

“Suicide By Semi”

9-1-1 Call Transcript

February 27, 2013 4:27PM MST

Time (Tape)	Party	Audio
00:02	Longmont 9-1-1:	9-1-1. What is the address of your emergency
00:05	Caller:	Okay, my friend, a friend of mine just called me and told me he was going to kill himself and I
00:10	Longmont 9-1-1:	Okay. Where is your friend at?
00:13	Caller:	I don't know. He hung up on me and said he's somewhere on I-25 and he was going to step in front of a semi. And he hung up on me. I don't know if you can put a trace on his phone.
00:21	Longmont 9-1-1:	What is your name sir? Sir, what is your name?
00:24	Caller:	Aaron ----- [Last name omitted for privacy reasons].
00:26	Longmont 9-1-1:	-----? [Last name spelled; omitted for privacy reasons]
00:26	Caller:	Yes.
00:27	Longmont 9-1-1:	Aaron what's the cellphone number you're calling me from please?
00:30	Caller:	303-656-----.
00:38	Longmont 9-1-1:	One more time for me.
00:41	Caller:	303-656-----.
00:47	Longmont 9-1-1:	Okay. And what's your friend's name?
00:50	Caller:	Josh, his name is Josh.
00:051	Longmont 9-1-1:	And his last name please?
00:54	Caller:	Oh God, um -----, Josh ----- [Last name omitted for privacy reasons].
00:56	Longmont 9-1-1:	And how old is Josh?
00:59	Caller:	27.
01:03	Longmont 9-1-1:	And so he called you on your phone, on your cellphone, stated that he was going to kill himself.

01:08	Caller:	Yeah, he gave me his parents' phone number and told me to call them, and tell them he loved them.
01:14	Longmont 9-1-1:	By stepping in front of a semi?
01:17	Caller:	Yes, Yeah, that's what he told me.
01:20	Longmont 9-1-1:	Okay. And where did he say he was? Other than I-25?
01:24	Caller:	Um, that's all he said. He said he was on the Interstate. I asked him like eight times, he wouldn't tell me.
01:30	Longmont 9-1-1:	So he didn't say I-25.
01:32	Caller:	No, he said the Interstate. That's all I know.
01:34	Longmont 9-1-1:	Okay. We've got a couple of Interstates, so...
01:39	Caller:	Yeah, he he drives, um, God Oh God, I think it's a Jeep Cherokee, it's a silver he said, he told me he was pulling over on the Interstate and he lives in Aurora, so, um, I'm kind of assuming it's I-25.
01:53	Longmont 9-1-1:	Okay, what kind of a vehicle is it? You said a Jeep?
01:58	Caller:	Yeah, I think it's a Jeep Grand Cherokee. I'm pretty sure it's a Cherokee, but um.
02:00	Longmont 9-1-1:	What color is it?
02:02	Caller:	It's silver.
02:11	Longmont 9-1-1:	Okay. What is your home address, sir?
02:16	Caller:	----- [Street address omitted for privacy reasons] Street, Lyons Colorado
02:20	Longmont 9-1-1:	----- [Street address omitted for privacy reasons] Street?
02:22	Caller:	Well actually no no never mind I'm sorry I don't live there anymore. I can't think straight right now it's um...
02:26	Longmont 9-1-1:	That's okay.
02:26	Caller:	---- it's ----- [Street address omitted for privacy reasons] Drive.
02:33	Longmont 9-1-1:	Okay. And what's your friend's phone number please.?
02:38	Caller:	Okay, it's

02:40	Longmont 9-1-1:	What is your Friend's Phone number?
02:42	Caller:	I thought I...Didn't I already say it?
02:43	Longmont 9-1-1:	No Sir You didn't
02:44	Caller:	303
02:44	Longmont 9-1-1:	Is that the 303 656-----?
02:47	Caller:	Yeah Yeah
02:48	Longmont 9-1-1:	I'm sorry, I was asking for your phone number when I got that Hang on one second
02:51	Caller:	Oh, I'm sorry. Yeah, that's his.
02:53	Longmont 9-1-1:	Alright. That's okay. Your phone number then?
02:56	Caller:	720-371-----]
03:05	Longmont 9-1-1:	Okay, Um , we will see what we can do, okay?
03:08	Caller:	Okay.
03:09	Longmont 9-1-1:	Alright, and, uh, I'll have an officer contact you?
03:12	Caller:	Okay
03:12	Longmont 9-1-1:	Alright, thank you sir for calling. okay, as soon as we have um, I'll have an officer call you as well, okay?
03:20	Longmont 9-1-1:	Do you know who his cellphone carrier is.? That will save me some time.
03:24	Caller:	Um, oh God, Um, it's, um, it's Verizon it's Verizon.
03:29	Longmont 9-1-1:	It is Verizon?
03:30	Caller:	It is Verizon.
03:35	Longmont 9-1-1:	Alright, and I'll have someone call you, okay? and we'll start tracing this as soon as we can. Did he mention, he just said he was going to throw himself in front of a vehicle, ah excuse me, a semi, am I correct?
03:44	Caller:	Yeah, that's what he said.
03:45	Longmont 9-1-1:	Okay

03:45	Caller:	He wouldn't tell me where he was.
03:47	Longmont 9-1-1:	Alright, Not a problem. We'll go ahead and get on this. Okay?
03:51	Caller:	Okay.
03:51	Longmont 9-1-1:	Thank you sir.
03:53	Caller:	Yeah.
03:54	Longmont 9-1-1:	Bye.
03:54	[Disconnected]	
04:01	[Dialtone/Dialing]	
04:10	Verizon:	You've reached the Verizon Wireless Law Enforcement Team
04:14	[Ringing]	
04:31	Verizon:	Hi this is Doug with Verizon Wireless Legal. Can I have your name and agency please?
04:35	Longmont 9-1-1:	Hi Josh my name is Christine Mason I'm with the Longmont Police Department.
04:42	Verizon:	You're with...I'm Sorry, what PD is it?
04:44	Longmont 9-1-1:	Longmont L-o-n-g-m-o-n-t Colorado
04:49	Verizon:	How can I help you today?
04:51	Longmont 9-1-1:	I'm calling to report um we just received a 9-1-1 call from a male party stating that his friend just called him stating that he wanted to throw himself in front of a semi and was on the Interstate on his cellphone.
05:05	Verizon:	Okay. What's the ah target telephone number?
05:08	Longmont 9-1-1:	303-656--- I'm sorry correction ----.
05:18	Verizon:	And what's the call back verification number for you?
05:20	Longmont 9-1-1:	303-651-8501.
05:27	Verizon:	And do you have one of our emergency information request forms?
05:30	Longmont 9-1-1:	I probably do.

05:32	Verizon:	Okay. I'll put you on a brief hold while I while I get the information okay. You're looking for location information, correct?
05:37	Longmont 9-1-1:	Yes sir, I am.
05:39	Verizon:	[Unintelligible.]
05:40	Longmont 9-1-1:	Thank you.
	[Background PSAP Noise as 9-1-1 Operator Searches through public records for additional information on the reported suicidal person.]	
09:16	Longmont 9-1-1:	Oh, Looky here. I found the guy.
10:08	Longmont 9-1-1:	[To someone in PSAP:] Sorry, I'm...I'm on hold.
10:26	Verizon:	Okay Ma'am. Thank you for holding.
10:29	Longmont 9-1-1:	No problem.
10:31	Verizon:	Hello.
10:32	Longmont 9-1-1:	Yeah. I'm here.
10:33	Verizon:	Okay, it looks like the last activity I have is at 16:10 today. It looks like he hit
10:38	Longmont 9-1-1:	Yes, that would be arou...
10:42	Verizon:	I'm sorry.
10:42	Longmont 9-1-1:	That would be it.
10:44	Verizon:	Uh, yeah. 1610 was the last time I have.
10:48	Longmont 9-1-1:	okay.
10:48	Verizon:	He hit cell tower number ah 589, which is located on 3855 Lewiston street in Aurora.
10:58	Longmont 9-1-1:	Can you spell that for me?

10:59	Verizon:	It looks like...sure L-e-w--i-s-t-o-n. Street in Aurora. Ah, looks like he was approximately .91 miles away from that particular location ah it looks like he was he hit sector 1 on the tower the center of that sector is at 350 degrees which would put him in the a I would say a north-northwest direction but plus or minus 60 degrees for the full width of the sector. Now the round trip delay measurement which is not which is not related to a GPS measurement but produces a call latitude and longitude of solely off the call signal [Unintelligible]. That latitude is, is 39.77221
11:44	Longmont 9-1-1:	One more time with that latitude 39.
11:46	Verizon:	Yep. point 77221
11:50	Longmont 9-1-1:	And the lat..I mean the...
11:51	Verizon:	and the longitude is negative ah negative 104.81809, and that should correlate with the distance.
12:02	Longmont 9-1-1:	Alright, thank you. I really appreciate it and I'll fill that out and get it back to you.
12:08	Verizon:	Okay, thank you.
12:08	Longmont 9-1-1:	Uh, can you just fax one over to me just in case
12:11	Verizon:	Sure, what's your fax number?
12:13	Longmont 9-1-1:	303-651-8972.
12:18	Verizon:	Okay, I'll send it right over.
12:20	Longmont 9-1-1:	Thank you sir. I really appreciate your time.
12:21	Verizon:	No problem.
12:22	Longmont 9-1-1:	Bye.
12:22	Verizon:	Yep, no problem.
12:25	[Disconnected]	
12:31	[Dial Tone/Ringing]	
12:43	Aurora 9-1-1:	Aurora Dispatch [Unintelligible]. Do you have an emergency?
12:46	Longmont 9-1-1:	Ah.

12:47	Aurora 9-1-1:	Hello.
12:48	Longmont 9-1-1:	Hi. My name is Christine with Longmont Police and Fire Department I'm calling to report a possible suicidal party.
12:55	Aurora 9-1-1:	Okay, where at?
12:55	Longmont 9-1-1:	Ah, to be honest with you, I did this off of the cellphone ping with Verizon wireless. I have a lat long. But I don't have a physical address. I do have the gentleman's physical address I obtained off the QDA from CBI. Here's how it went down. I received a 9-1-1 phone call from a Aaron ----- who resides at ----- Drive in Longmont.
13:25	Aurora 9-1-1:	---- [Street number omitted for privacy reasons]
13:27	Longmont 9-1-1:	----- one word --- [Street omitted for privacy reasons]
13:29	Aurora 9-1-1:	Alright. I have multiple things going on and I may have to throw you on hold because I'm also on fire. That's ---- and that's north or south -----?
13:36	Longmont 9-1-1:	There is no north or south, it's just ----- Drive, in Longmont.
13:40	Aurora 9-1-1:	Got it. Okay. In Longmont. Okay.
13:42	Longmont 9-1-1:	Aaron's phone number is 720-371-----
13:51	Aurora 9-1-1:	Okay.
13:51	Longmont 9-1-1:	States his friend Josh ----- [Last name omitted for privacy reasons], 27 year-old male phoned from 303-656----- stating that he was in his silver jeep, was going to pull over on the Interstate and commit suicide by stepping in front of a semi.
14:16	Aurora 9-1-1:	We just had somebody step in front of a vehicle less than 2 minutes ago.
14:19	Longmont 9-1-1:	Are you kidding me?
14:20	Aurora 9-1-1:	A silver chief was pulled off and stepped in front of a semi.
14:24	Longmont 9-1-1:	Yeah, I've got a license plate on the vehicle that I obtained off the QDA of ----- . [To someone else in Longmont PSAP: "He did it.]
14:31	Aurora 9-1-1:	----- . Okay.
14:32	Longmont 9-1-1:	Yep.
14:32	Aurora 9-1-1:	Okay

14:33	Longmont 9-1-1:	And I have..
14:35	Aurora 9-1-1:	Is that correct?
14:38	Aurora 9-1-1:	I'm sorry.
14:39	Longmont 9-1-1:	That's what I obtained off of the QDA. [Background: "Her suicide did it."]
14:44	Aurora 9-1-1:	Okay. I'm double checking it because I'm betting your 9-1-1 ...
14:47	Longmont 9-1-1:	Yeah, I've got an address...
14:48	Aurora 9-1-1:	got hit by a tractor trailer, okay
14:51	Aurora 9-1-1:	Alright, what's the address you've got?
14:54	Longmont 9-1-1:	I have an address off the lat. long.
14:57	Aurora 9-1-1:	Uh hum
14:58	Longmont 9-1-1:	of 39.77221 longitude negative 104.818
15:10	Aurora 9-1-1:	point 818
15:12	Longmont 9-1-1:	09
15:14	Aurora 9-1-1:	09
15:15	Longmont 9-1-1:	The gentleman at Verizon said he was .19 miles away from ah a cell tower at 3855 Lewiston, and it should be in a north-northeast direction.
15:32	Aurora 9-1-1:	Pretty close to where we're ... okay.
15:35	Longmont 9-1-1:	The gentleman's name ah on the QDA. ah, his address is ----- [Street address omitted for privacy reasons] Avenue.
15:46	Aurora 9-1-1:	Okay, give me just a second here. Hold on.
15:47	Longmont 9-1-1:	No worries.
15:54	Aurora 9-1-1:	Okay.
16:08	Aurora 9-1-1:	Okay.
16:14	Aurora 9-1-1:	Yeah. [Unintelligible] real quick, I don't know if this is his home or not. Sorry, I'm grabbing another dispatcher here.

16:21	Longmont 9-1-1:	You're fine. It's particularly okay. I totally understand.
16:25	Aurora 9-1-1:	Um...hold on, I'm trying to pull up an actual address...
16:31	Longmont 9-1-1:	You're fine. No worries.
16:47	Aurora 9-1-1:	Yeah, well I'm fairly certain that's the same one because it is only about a quarter mile away.
16:53	Longmont 9-1-1:	Yeah, he, there's no coincidence like that.
16:56	Aurora 9-1-1:	Yeah. [Unintelligible]
16:59	Longmont 9-1-1:	Absolutely.
16:59	Aurora 9-1-1:	[Unintelligible]
17:01	Longmont 9-1-1:	Yep, I know.
17:02	Aurora 9-1-1:	So....hold on
17:04	Aurora 9-1-1:	[Unintelligible] Let me check with my PD dispatcher and see if this vehicle matches up okay?
18:03	Longmont 9-1-1:	You're fine.
18:40	Aurora 9-1-1:	Okay, and what was your name again?
18:42	Longmont 9-1-1:	My name is, ah, Christine Mason.
18:46	Aurora 9-1-1:	Christine, okay and a call back number there if I find I need you guys.
18:49	Longmont 9-1-1:	Longmont PD, 303-651-8501.
18:55	Aurora 9-1-1:	8501. okay. okay, they're not able to tell me yet but, ah, we've got both on the scene responded to so we'll go ahead and a I guess we'll let you know.
19:13	Longmont 9-1-1:	If you guys need a tapes request let me know, okay?
19:17	Aurora 9-1-1:	Okay, and a just my other question here. is, a was there anything else that they gave you, or any thing like that?
19:22	Longmont 9-1-1:	He didn't give me any other information.
19:25	Aurora 9-1-1:	Okay, except the lat long. Okay. I appreciate it. so much
19:28	Longmont 9-1-1:	Not a problem. uh hum. Goodbye.

19:30	Aurora 9-1-1:	Alright. Goodbye.
19:31	[Disconnected]	
	[Portion of Recording Not Related to Suicide Deleted]	
20:44	Longmont 9-1-1:	This is Christine.
20:46	Caller:	Hi, are you the one that I talked to earlier?
20:48	Longmont 9-1-1:	Is this Aaron?
20:49	Caller:	Yes.
20:50	Longmont 9-1-1:	Hi Aaron. I did speak with you earlier. How can I help you?
20:55	Caller:	Um, ah , I think he did it.
20:57	Longmont 9-1-1:	Okay. What makes you think he did it?
21:00	Caller:	He called me, and he told me that he was going to step in front of a semi truck, and then I could hear the cars in the background, and he said he was on the Interstate, and then
21:08	Longmont 9-1-1:	Um hum.
21:08	Caller:	Uh, it just went dead. And now when I call his phone, all I hear, is just, two beeps.
21:14	Longmont 9-1-1:	Okay.
21:14	Caller:	and a long beep.
21:15	Longmont 9-1-1:	Alright.
21:16	Caller:	and
21:18	Longmont 9-1-1:	Aaron, here's what I've done so far. I contacted Verizon ah security and obtained a ping for his cell phone. I was able to um I was able to secure a lat long on his cellphone from where it was at, and it shows that it's still in Aurora Colorado. Um, what I will do, is transfer you over to Aurora, I have already contacted them to let them know the situation, and they may be have further information that they're able to provide you at this time. okay?

21:50	Caller:	Okay.
21:51	Longmont 9-1-1:	If I lose you, please call me back on 9-1-1 and I'll stay on the line with you until I get you transferred. Okay?
21:57	Caller:	Okay. I, ah I just want to know something.
22:00	Longmont 9-1-1:	Sure, I understand. It may be a little bit of time, sir, before you can, ah, know anything. Okay?
22:07	Caller:	Okay.
22:07	Longmont 9-1-1:	Do you understand what I'm saying?
22:09	Caller:	Yeah, I do. I'm, I'm, I, I just don't know what to think right now.
22:13	Longmont 9-1-1:	Okay. Is there anybody with you?
22:16	Caller:	Um, yeah, I got a friend.
22:18	Longmont 9-1-1:	Okay. Alright. If you'll hold for just a moment sir, I will transfer you.
22:22	Caller:	Okay.
22:23	Longmont 9-1-1:	Thank you for your patience.
22:31	[Ringing]	
22:39	[End of recording]	

Exhibit No. 2

City of Boulder, Colorado, PSAP Telecommunicator Job Posting

**CITY OF BOULDER
POSITION DESCRIPTION**

DATE: 2/8/16

POSITION TITLE: Police Dispatcher

EMPLOYEE GROUP: BMEA-G

DEPARTMENT/DIVISION: Boulder Police Department

OVERALL JOB OBJECTIVE:

Under direct supervision, this job requires multi-tasking skills and the ability to make quick decisions. Answer emergency telephone lines and obtain information from callers. Prioritize calls and provide proper pre-arrival instructions to callers. Document calls by inputting necessary information in the Computer Aided Dispatch (CAD) system.

DUTIES & RESPONSIBILITIES:

1. Receive and process emergency and routine telephone calls concerning police, fire and EMS matters. Provides pre-arrival instructions for callers needing medical help. Operates the TDD system (Telephone Device for the Deaf).
2. Broadcasts calls for service to appropriate police officers; monitors the status of personnel and equipment and coordinates emergency operations as needed through radio communications. Continually monitors radio traffic; provides supplemental information or dispatches additional personnel and equipment as needed. Operates the Colorado Crime Information Center (CCIC/NCIC) computer system and relays detailed and accurate information to police officers.
3. Monitors intrusion and fire alarms for the public safety building and Community Police Centers. Monitors flood alarms, automated stream and rain gauges and color weather radar and initiates severe weather warnings and flood alert procedures.
4. Assists in training new dispatchers and new officers; functions as a liaison between the communications and the public, other departments, divisions and outside agencies and organizations. May operate communications through a command van on pre-planned or spontaneous emergency events.
5. Other:
 - Performs related duties as required to meet the needs of the City.
 - Takes proper safety precautions, anticipates unsafe circumstances, and acts accordingly to prevent accidents. Responsible for the safety of self, others, materials, and equipment. Uses all required safety equipment and follows all safety regulations, policies and procedures. Reports all accidents and damage to City property.
 - Responsible for knowing and complying with all City and department policies; participating in professional trainings and development; and adhering to attendance and workplace attire policies.

Generally, duties and responsibilities are listed from most to least critical or time consuming.

QUALIFICATIONS:

REQUIRED MINIMUM QUALIFICATIONS:

Demonstrated ability to handle multiple demands simultaneously, deal with interruptions, and handle difficult situations under time pressure. Ability to communicate clearly and effectively. Ability to receive, comprehend, and rapidly relay accurate information. Ability to maintain self-control during periods of extreme stress and pressure. Ability to handle confidential information in a secure, professional and discretionary manner. Ability to work closely with others to maintain calm, efficient operations. Demonstrated interpersonal, problem solving, and conflict resolution skills. Attention to detail and organizational skills. Flexibility and openness to change.

Ability to learn Computer Aided Dispatch and Enhanced 9-1-1 communication system. Ability to obtain EMD certification within probationary period. Ability to obtain CPR certification. Ability to type at least 35 words per minute. Valid Colorado driver's license and acceptable driving record. Acceptable background information including criminal history. Due to the inherent duties of this position, applicants selected to continue will undergo a thorough background investigation. City of Boulder Police Employee job application required.

DESIRED QUALIFICATIONS – In addition to the required minimum qualifications:

Prior dispatch experience. Bachelor's degree. Work experience in a Public Safety Answering Point (PSAP). Experience working with Tritech. Bilingual in English/Spanish.

Background Information:

Demonstrated personal and professional honesty, integrity, good judgment as shown in applicant's criminal history, background and motor vehicle record, and use of drugs and alcohol. Preference will be given to applicants who have no history of use, sale or possession of illegal substances. Polygraph or Computer Voice Stress Analyzer used for verification of applicant information. Prior to employment, successful applicants are required to submit to a drug test. Some positions will also require medical and/or psychological testing prior to employment.

The following will exclude any applicant:

- Any felony conviction.
- Use, even if by prescription, of any marijuana, marijuana edible or marijuana concentrate within the prior two years.
- Any ownership or interest in a marijuana dispensary within the past three years
- Use, sale, transfer or possession of any illegal controlled substance within the past five years. Examples of such substances include cocaine, heroin, MDMA (ecstasy), etc.
- Unlawful sale or fraudulently obtaining any scheduled controlled substance within the past five years. Examples of such scheduled substances include morphine, codeine, OxyContin, Vicodin, Demerol, Fentanyl, Dilaudid, Xanax, Valium, Ritalin and Adderall.
- Commission of a felony, whether convicted or not within the past five years.
- Commission of a non-traffic related misdemeanor, whether convicted or not within the past three years.
- Excessive number of traffic offenses.

The following will be considered on a case-by-case basis. There will be no tolerance for a pattern of behavior in the following.

- Use of a lawful substance that was prescribed to another person.
- Any affirmative responses to the above exclusion list that is outside the time limits. Example, an applicant discloses using heroin more than five years prior.

WORKING CONDITIONS - Required Physical and Mental Effort, and Environmental Conditions:

Physical Demands: Primarily sedentary physical work with constant sitting up to 8-14 hours/day. Constant and repetitive use of the hands for simple grasping and fine manipulation. Constant and repetitive use of the feet to operate foot controls for radio-transcription. Frequent and repetitive hand/eye coordination to operate personal computer and office equipment. Occasional lifting up to 10lbs. Occasional walking and standing up to 2 hours/day. Occasional bending, squatting, kneeling, pushing/pulling of light objects, climbing stairs and reaching overhead. Vision for reading, recording and interpreting information; speech communication and hearing to maintain communication with employees, co-workers and the public.

Work Environment: Works primarily in a dispatch center, but may occasionally be required to attend meetings outside of the department or work in the Incident Command Vehicle. Exposure to a darkened environment, air conditioning, and dust.

Machines and Equipment used in work include, but are not limited to the following: Frequently uses standard office equipment consisting mainly of telephone banks and multi-screen computers. Constantly uses a headset.

ACCOMMODATIONS: Reasonable accommodations may be made to enable qualified individuals with disabilities

to perform the essential functions of this position.

Note: The above description is illustrative only. It is not meant to be all-inclusive.

Testing Process:

1. Application screening
 2. Computer skills test
 3. Pre-employment interview
 4. Oral Board interview
 5. Computer Voice Stress Analysis Test
 6. Psychological job suitability test and interview
 7. Background check
 8. Conditional job offer drug screening
 9. Final job offer
-

Exhibit No. 3

Descriptions of the CritiCall Pre-Employment Skills-Test Modules
for Telecommunicator Positions.

CritiCall®

Test Descriptions

Public Safety Dispatcher/Calltaker Pre-Employment Skills Testing Software

CRITICALL gives you the power to test actual skills and computer-related multi-tasking abilities so highly coveted in the dispatching field.

Audio tests require that test takers listen over a headset instead of reading. All tests are self-scoring (with the exception of vocal tests).

DECISION MAKING

Measures: The ability to make decisions quickly and accurately and to correctly signal the response using a computer. Also measures long-term memory of formal decision rules.

Emergency situations are presented to the test taker in an information window on the screen. The applicants must quickly respond by choosing the most appropriate agency using the rules they have learned as their guide.

To simulate the multi-tasking environment of calltakers and dispatchers, similar decision-making scenarios automatically activate as other CritiCall test modules are being administered.

DECISION MAKING (VOCAL)

Measures: The ability to make decisions quickly and respond to emergency situations vocally. The responses are recorded and will later be assessed by the test administrator.

DATA ENTRY

Measures: The ability to read written data (e.g., name, telephone number, license plate sequence) and accurately enter that data using a keyboard. Test takers enter data from on-screen information into blank data entry fields, located in a separate portion of the screen. Multi-tasking is also measured using a decision-making task.

DATA ENTRY (AUDIO)

Measures: The ability to hear audible data (e.g., name, telephone number, license plate sequence) and accurately enter that data using a keyboard. Instead of entering data from on-screen information, test takers enter information they audibly hear into blank data entry fields. In the first part of the test, information is provided in linear order, to match the layout on the screen. In the latter portion, information is provided out of order, to simulate the possibility of a caller providing information in a fractured manner. Multi-tasking is also measured using a decision-making task.



CALL SUMMARIZATION 1 (AUDIO)

Measures: The ability to hear, comprehend, and summarize audible information. Test takers listen to a short story and enter notes about that story into a computer. They are then asked to summarize the story by answering multiple-choice questions. Multi-tasking is also measured using a decision-making task.

CALL SUMMARIZATION 2 (AUDIO)

Measures: The ability to hear, comprehend, and utilize audible information while accurately entering that information using a keyboard. Test takers listen to a simulated telephone call and enter detailed information into the computer. They must then respond to a series of multiple-choice questions about the information they heard by using the information entered into the computer and/or their memory. Multi-tasking is also measured using a decision-making task.

CALL SUMMARIZATION 2 MULTI-TASKING (AUDIO)

Measures: Similar to the Call Summarization 2 test, it contains more decision making/multi-tasking items. Its score reflects a combination of the accuracy of the data entered, and the responses to both the multi-tasking and multiple-choice items.

CROSS-REFERENCING

Measures: The ability to locate information, requested in writing, on a written list and to correctly and accurately respond using a keyboard. Test takers are presented with an address book containing names, telephone numbers, and addresses on the screen. Using the address book list,

CritiCall's

wide array of

tests provides a

comprehensive

inventory of a

candidate's skills

and abilities.

The software's

flexibility allows

customization

of your test

administration to

the specific skills

that you consider

most important

for your agency.

they must answer written questions by cross-referencing specific information and then entering the correct response into the space provided on the computer screen.

CROSS-REFERENCING (AUDIO)

Measures: The ability to locate information, requested audibly, on a written list and to correctly and accurately respond using a keyboard. This test is similar to the cross-referencing test module, except that the questions are presented audibly over a headset.

CROSS-REFERENCING (AUDIO-VOCAL)

Measures: The ability to locate information requested audibly on a written list and to correctly and accurately respond vocally. Test takers receive information audibly over a headset and are asked to respond verbally by stating the cross-referenced information into a microphone. A test administrator later assesses the recorded responses.

VOCALIZATION SUMMARY

Measures: The ability to hear and accurately vocalize data, separating relevant from irrelevant information. Test takers listen to a statement and are then asked to verbally repeat into the microphone a selected portion of the statement (*i.e.*, the address). A test administrator later assesses the recorded responses.

CHARACTER COMPARISON

Measures: The ability to compare and contrast written data. In this multiple-choice test, test takers are presented with a series of characters and text. They will then be asked to correctly identify the matching character sequence against a group of similarly phrased alternate characters.

MEMORY RECALL

Measures: The ability to learn and later recognize associated information. Test takers are shown several pairs of words on the computer screen that disappear after a short time. The test taker is then provided one of the paired words and asked to choose the word that it had been paired with (*e.g.*, red Dodge, yellow Ford).

MEMORY RECALL ALPHA/NUMERIC (AUDIO)

Measures: The ability to hear data, memorize it, and then use a keyboard to accurately enter the data. Test takers listen to a series of numbers and letters (to mimic serial numbers or license plate sequences), and are then asked to enter the information into the computer based on their memory of the information just provided.

MEMORY RECALL NUMERIC (AUDIO)

Measures: The ability to hear data, memorize it, and then use a keyboard to accurately enter the data. Test takers listen to a series of seven-digit telephone numbers and are then asked to enter the number from memory a few moments later.

PRIORITIZATION

Measures: The ability to evaluate and analyze information in order to prioritize or categorize incidents. Test takers are presented with multiple-choice questions that ask

them to choose the priority status of a series of situations based on decision rules they are provided.

MATHEMATICS

Measures: The ability to use basic arithmetic skills to calculate distances, amounts, and other job-related tasks.

PROBABILITY

Measures: The ability to use the frequency of supplied information to determine the most likely correct solution. Test takers are presented with multiple-choice scenarios, that come in the form of a series of addresses, telephone numbers, and other information. The test taker is then asked to choose a response that has the greatest probability of representing the correct information.

MAP READING

Measures: The ability to use maps for determining routes and locations. No previous map-reading training is required for success.

Test takers are given a series of scenarios that measure their ability to choose the most direct route while obeying all traffic rules. They will also need to provide directions and answer general questions about routes and directions on the maps shown on the computer screen.

READING COMPREHENSION

Measures: The ability to read and comprehend passages that are written at a job-related level. During this section of the test, candidates read a written passage, and then choose the best response relating to that passage. The reading passages in this test module include text adapted from the standard operating procedures and training materials of police, fire, and ambulance communication centers from around the country. It also contains passages based on text contained in IFSTA's nationally recognized training documents.

The International Fire Service Training Association, Inc. (IFSTA) has allowed CritiCall to use selected passages from their copyrighted materials for several items in this test module.

SPELLING (AUDIO)

Measures: The test taker's ability to correctly spell words that sound similar, but are spelled differently and have different meanings depending on the context in which they are being used. These words, if misspelled, might communicate an incorrect meaning to the recipient which could delay assistance.

SENTENCE CLARITY

Measures: The ability to recognize clearly written passages. An applicant is presented with two written passages and must choose the passage that most clearly communicates the meaning.



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CC0806

Exhibit No. 4

Accessibility Report

Communications Subcommittee, Colorado 9 1 1 Task Force

Adopted July 14, 2016



Communications Subcommittee Report to the Colorado 9-1-1 Advisory Task Force

Date: July 14, 2016

Introduction

The goal of this subcommittee is described in the vision statement, “All deaf, deafblind, hard of hearing, and speech disabled must have access to 911.” Currently, the only requirement for Public Safety Answering Points (PSAPs) concerning accessibility is a federal mandate that they be equipped to handle calls received from callers using teletypewriter (TTY) devices¹.

The narrowness of requirements for PSAPs to meet the needs of disabled callers has led to a number of concerns among deaf, deafblind, hard of hearing, and speech disabled citizens. It was this committee’s goal to recommend actions to the Task force to improve the responsiveness of PSAPs to the disabled community’s need for equal access to emergency services.

Options for DDBDDHH and SD Callers

A number of different options exist for deaf, deafblind, hard of hearing, and speech disabled citizens to contact 911, they are:

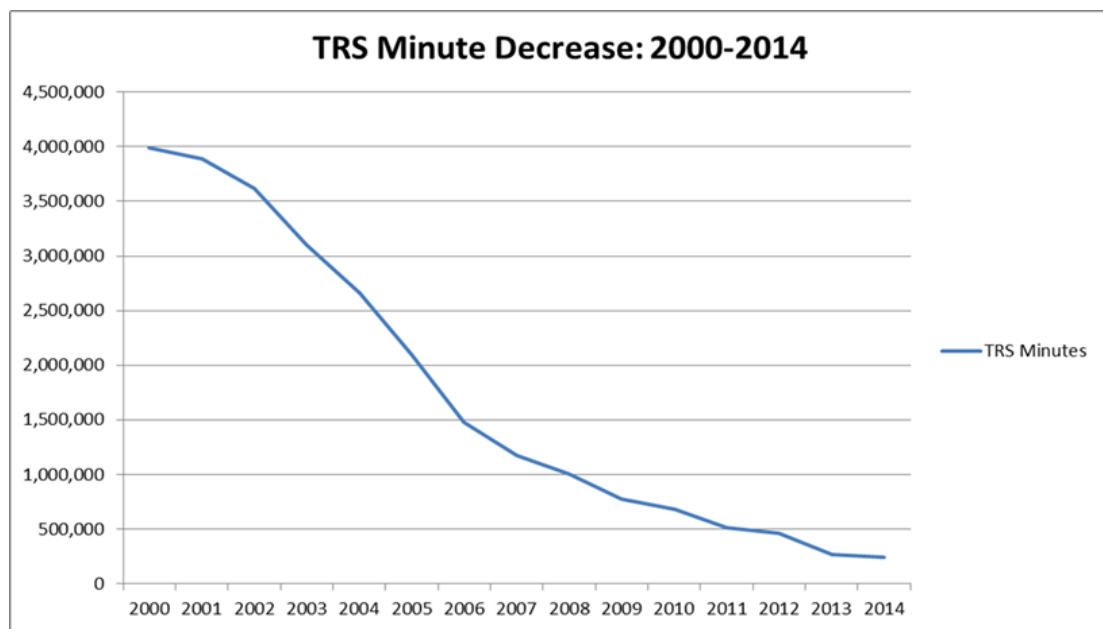
- **TTY Devices.** Few deaf, deafblind, hard of hearing, and speech disabled citizens regularly use TTY devices to communicate. A survey conducted by the Federal Communications Commission’s Emergency Access Advisory Committee in 2011 revealed that 45.1% of disabled respondents would prefer to be able to contact 911 via SMS text message, the most preferred of the options listed.² Implementations of wireless TTY service have been contemplated, but is not yet publicly available. In the meantime, the use of TTY devices by the disabled community has dropped rapidly, with only

¹ 28 C.F.R. Part 35. For a good summary of federal authority and efforts on the issue of accessibility for 911 services, see Chance, et al. *Summary of the Legal and Policy Landscape Surrounding Accessibility and 911*. Apr 24, 2015. Unpublished work. Colorado 9-1-1 Resource Center document collection.

² Emergency Access Advisory Committee (EAAC). "REPORT ON EMERGENCY CALLING FOR PERSONS WITH DISABILITIES SURVEY REVIEW AND ANALYSIS 2011." Federal Communications Commission. 21 July 2011. Web. 1 Sept. 2015. <<https://transition.fcc.gov/cgb/dro/EAAC/EAAC-REPORT.pdf>>. p.22

about 20,000 emergency calls being made per year³. TTY devices do provide location information when used to call 9-1-1, the same as a voice call being made by landline.

- **Relay Services.** Includes Telecommunication Relay Services (TRS), Video Relay Services (VRS), and IP Relay Services. While still used by some deaf, deafblind, hard of hearing, and speech disabled individuals, TRS has seen a decline in usage over recent years for the same reason as the reduced usage of TTY devices to contact 911 directly, namely that TTY and TRS require a traditional landline. All relay services share other drawbacks, not the least of which is that they are not easily made mobile. They also involve the relaying of information to the PSAP by a third party service, and there may be a wait time before being connected to an interpreter, which may in turn delay connection to the PSAP. Relay calls may also be difficult for 911 telecommunicators to process because they receive so few of them, and in some cases may not receive proper training on how to process the call. Relay calls in some cases lack location information that could be associated with a 911 call received directly from a landline or wireless device.



Number of TRS Call Minutes in Colorado by Year

- **Captioned Telephone.** Used by individuals who can speak but need assistance in understanding the other party on the phone. In most cases, a third party listens to the call and transcribes the speech of other party for the caller using voice recognition software, and that transcription is displayed on the caller's screen. If 911 is dialed, however, the call is placed directly to the 911 call center, in which case the relay

³ [EAAC. p. 12.](#)

operator is not on the line to transcribe the telecommunicator's part of the conversation. In this case the telecommunicator could communicate via TTY to the caller, but PSAP equipment and a lack of training for these specific situations could make this problematic. A Captioned Telephone user could call the PSAP via a seven-digit administrative line, but then the caller is not receiving the benefit of enhanced 911 location information and in most PSAPs administrative lines received a lower answering priority than 911 lines. Among these potential problems, captioned telephone has the drawback of not being mobile. If used to call 911 directly and used as a TTY, this method would provide location information, but used through a relay service the caller's location may be unavailable or incorrect.

- **Others.** There is a long list of other communications methods that a caller with an access might use, depending on the nature of their disability. These include IP instant messaging, Email, voice carry over (VCO) phones, and more. All of these methods have various limitations, most notably that they require an Internet connection or specialized equipment that may not be convenient for mobile use.

Methodology

In order to understand the current capabilities and practices of PSAPs in Colorado concerning accessibility to 911, the subcommittee issued a survey to the PSAPs with the assistance of the Colorado 9-1-1 Resource Center. A survey was also developed to determine the needs and expectations of deaf, deafblind, hard of hearing, and speech disabled members of the public, but was never distributed due to the logistical difficulties and costs of distribution. Alternatively, the subcommittee relied on surveys previously conducted by the Federal Communications Commission, as well as discussions with and inclusion of members of the disabled community in the subcommittee.

PSAP Survey

The response rate to the PSAP survey was initially very low, and subsequent releases of the survey and appeals for participation meant that the responses were received over a period of over two months, early in 2015. A total of 25 responses were eventually received, out of 97 total PSAPs, for a response rate of 25.8%.

1. Please select the option that describes your PSAP's use of TTY devices.
 - a. TTY capability from every position: 22 (88%)
 - b. TTY capability from some positions: 2 (8%)
 - c. No TTY capability: 1 (4%)

2. Provide the number of TTY calls, silent lines and hang-ups received each month for the past year.
 - a. Numbers ranged from zero to 12,013, though it should be noted that some PSAPs, as a matter of policy, initiate TTY calls on any call with an open line and no one speaking. In the cast of the highest number (12,013), the respondent does not differentiate between open line calls with TTY initiated by the PSAP and calls in which the caller was using a TTY device.
 - b. Several respondents stated that they did not track TTY calls separately and were unable to provide a response.
3. Are there procedures in place to ensure that call takers are querying all silent lines with TTYs? If so, describe them.

Yes
Yes. SOG states that for any dead air calls to attempt TTY contact.
Yes
Written procedure to query all silent line 911 calls
Yes P&P and QA
Yes, Call taker must follow TTY Protocol
<p>Yes,</p> <ul style="list-style-type: none"> • Call back: The call taker will attempt to call back a telephone when a 9-1-1 call is routed to the PSAP and the call disconnects before personnel can determine if assistance is needed. Personnel will call the number back once to make this determination. If the wireless phone is busy or there is no answer, additional attempts to contact the caller will not be made by communications personnel. If the callback attempt goes to voice mail, no message will be left. • Silent calls: In compliance with Public Law 101-336, also known as the Americans with Disabilities Act, all silent calls will be interrogated with a TDD/TTY to determine if the caller is attempting to report an emergency using a special communications device for hearing impaired individuals. • Contact: If contact is made with the caller, communications personnel will follow call-handling procedures to determine whether a public safety response is necessary. • Indicated Emergency: Any evidence of an emergency situation requires that communications personnel initiate efforts to re-contact the caller to determine the nature of the incident and an accurate location for appropriate public safety response, according to procedures established by the local agency. If attempts to contact the caller are unsuccessful, a field public safety response will be initiated based on the caller location provided by the 9-1-1 system. Extraordinary attempts to locate a Phase I or II wireless 9-1-1 disconnect caller will only be made in the instance where an emergency is clearly indicated. <ul style="list-style-type: none"> o Enter in CAD as a 9-1-1 hang up o Advise the responsible LEO, if the LEO does not respond note his comments in CAD and Quote them. o Clear the call with a NAR

<p>Mandatory Call Back: Regardless of the source, all silent, hang-up or abandoned E/9-1-1 calls for service, including wireline and wireless callers, should be:</p> <ul style="list-style-type: none"> o Entered in CAD as 9-1-1 Hang-up o Called back for need verification 17. If service is not needed, the call taker should note with whom they spoke, the reason 9-1-1 was dialed (e.g., accidental, misdial), and any other explanatory or “intuitive” observations discerned from the call taker’s exchange with the caller. A Clearance code shall be added to the call record for statistical analysis and documentation Unless a plausible explanation is provided to the call taker, at a minimum, the call taker should consult OIC
Yes, if there is no answer from a caller, we press the TTY button on our phone screen to see if we get a response from a TTY.
Yes, written policy to utilize the Viper TDD software
Yes. By written policy call takers are required to query all silent emergency calls in to the center. We also provided bi-annual training on the proper handling of TTY calls which includes instruction on querying silent calls.
Yes...all call takers are required to wait on the line; instruct if there is an emergency to push a button on the phone; etc.
Yes. All silent calls on 911 lines as well as admin lines must be TTY challenged. We also use TTY-PASS and TTY-PASS E to test the equipment as well as the call takers.
<p>Yes, this is our procedure:</p> <p>Dispatchers will activate a TDD query on any incoming phone line where there is no conversation initiated by a caller still on the line. This procedure guards against the loss of phone calls from hearing impaired persons, who may not realize the police are on the line until they receive the audible tone. If there is no answering tone when the TDD message is activated, the dispatcher may then disconnect the call.</p>
Yes
Software detects ASCII carrier and queries immediately
Yes
Standard Operating Guideline (SOG) 236.V mandates that all silent lines be queried with an automatic message identifying us and asking the caller go Go Ahead (GA).
Yes, on any silent line they are required to send TTY tones.
No at this time
No, phone system automatically connects TTY calls.
Yes, any open line that does not provide a verbal acknowledgement we are required to start the TTY process.
SOG directive and training. Otherwise no method of verifying.
SOP governing mandatory querying of all silent lines.
If no voice or TTY - try recalling number calling in

We do in service training for TTY procedures, however a completely silent open line is extremely rare. If we hear voices or noise in the background, pocket rustling, or a car driving, that's not completely silent. We will go through TTY procedures on totally silent line.

4. What other technology does your center currently deploy to assist the hard-of-hearing/deaf/speech impaired community with accessing 911?

Smart 911 and Text to 911 next week!
The primary PSAPs in Jefferson County are getting ready to start testing Texting to 911. Most PSAPs in Jefferson County also use Smart911 - another program that provides texting.
We are a secondary PSAP. Jeffco and Clear Creek are primary.
No other technology
Denver 911 utilizes three (3) cellular phones as TEXT PAGERS & an EMAIL account to communicate with the D/HH community for 911 services. The cell phones provide avenues of communication that are easily accessible and understood by the D/HH community (link to Deaf and HH flyer publication).
None
Colorado Relay
We have no other technology in place at our center (text to 9-1-1) for persons to contact us yet.
No other technology right now. Text to 9-1-1 in April
text-to-911
We have Smart 911 which enables a caller to communicate with us via text message. Callers can also provide a profile that indicates if they are hearing impaired if they have to call directly so that the dispatcher knows to try to communicate with them via text.
Text 2 911
None
Text to 911
None
Very close to implementing Text to 911.
nothing at this time
None
TTY. We have used Colorado Relay services in the past.
Smart 911, text to 911 via Gem911 software
Text to 911 is Available for those within Arapahoe County
text to 911

We use Everbridge for our Emergency Notification System and the community can register to receive text, email and voice notifications. This is for emergency use only.

5. Does your center test the technology in place to ensure it is working and processed correctly within the center? If yes, how often is the equipment tested?

Yes, every 6 months
Yes. We test TTY quarterly.
Yes - quarterly
Semi Annual testing
<p>The TTY/TDD functionality and message usage will be tested regularly with the police district stations, to test functionality and understanding of the language and communication style.</p> <ul style="list-style-type: none"> • The test will occur monthly on each shift with each police district station. • A log will be completed with the results from each district and the results. • The log will be emailed by the supervisor responsible for the project to the district liaisons or commanders.
bi annual at this time. Implementing TTY from NENA
We test once a month with each dispatcher. In-house.
We check with each open line call if we do not hear voice.
Yes, monthly through NENA
<p>Yes. On a weekly basis every position is tested to ensure that the TTY modules are in working order. Call takers are also trained in the processing of TTY calls through role playing exercises on a bi-annual basis.</p>
Not at this time
yes monthly
Yes, no set schedule, just periodically.
Yes. Monthly each dispatcher sends and receives a TDD
No
Yes, it is tested each week.
Twice per year
Daily
Nothing in place at this time
Periodically, presently working on a policy for monthly testing/familiarization
Yes, we test once a week (every Sunday).
<p>Yes, weekly smart 911 calls. Just implementing text to 911. We do not do regular tests of the TTY function on our phone system.</p>

Yes, monthly testing of receiving and sending calls is required. They also complete training in TDD calls quarterly.
Text yes - TTY no
yes, annually

6. What are your center's future plans in regards to technology that allows the community to access 911? Provide dates and timeline if known.

Text to 911
As stated above, the primary JeffCo PSAPs will be starting with texting through GEMS and eventually the 3 secondary PSAPs as well.
Text to 911
Text to 911 is currently in the testing phase.
New phone system is in development to accept all text to 911.
Text to 911 - unknown timeline
Looking to upgrade our phone system and currently talking with LETA for assistance
We will be accepting text to 9-1-1 within the next year.
Text to 9-1-1 April 2015
requesting a 911 upgrade
no plans
We are in the process of implementing SMS to 911 in May, 2015.
Maintain and monitor for changes in technology
NG911 compliance when available
Text to 911 is the only technology in the works right now.
Text-to-911 is anticipated for future access.
Hopefully implementing Text to 911 by the end of 2015.
Nothing in place at this time
Exploring implemetation of Text to 9-1-1
Text to 911 goes live May 1st.
With the implementation of Text to 911 I am not aware of any other technology available, but would gladly look at any other options that are also out there.
Unsure
We have signed a contract with Intrado to implement Texting to 911, hopefully by end of second quarter 2015.

7. Text-to-911. Choose the option that best describes your situation.
- a. We accept text-to-911 calls: 6 (24%)
 - b. We plan on accepting text-to-911 calls in the near future: 17 (68%)
 - c. We plan on partnering with another PSAP to accept our text-to-911 calls for us: 0 (0%)
 - d. We do not currently have a plan for accepting text-to-911 calls: 2 (8%)
8. What outreach efforts does your PSAP or 911 Authority undertake (i.e., mailers, TV with closed caption, etc.) to educate the deaf/hard-of-hearing/speech-impaired community on how to request emergency services?

banners and newspaper ads. social media
Thru 911 authority. Ed in schools and community events
About once a year we attend the local organization. The region's center for independence meets here in Grand Junction and we work with them and the media to provide information and a question / answer session at one of their meetings.
Public education event throughout the year. Smart 911 education including public service videos.
The authority provides posters and flyers. They have produced a PSA that is available as well.
Quarterly news letter to all city residents
None at this time
Our department no longer has a Community Outreach Division, so we rely on the 911 Authority Board to handle these types of requests.
NA
We default to our primary PSAPs.
No current plan
We work directly with our City's Director Interpreter Office of Sign Language Services
Only outreach at this time is with Code Red for Reverse 911 notification
None at this point. I am interested in implementing a process
none at this time
We do public education on calling 911 and Smart 911, have brochures to this effect, but we do not have targeted programs specific to the hearing impaired community.
None
None
911 Authority has close relations with community.
None
Not much in the past, but will with the Text to 911.

None
None at this time. We are working towards a Public education team that will also include this type of information.

9. What training / education does your center provide to your employees about the Deaf and Hard of Hearing/Speech Impaired community's communication techniques and methodologies?

will email
None currently
As supervisors and Training Officers attend updated courses we bring that information back and "siphon" it through our call take specialist position who puts out continuing education material to our staff.
In training academy and on the job learning with use of the TTY on our phone system. Additional briefings on communicating with the deaf and hard of hearing community have been presented this year.
This is being researched to be added to our PSA's, the Text to 911 one is, and we are now looking at adding this to the OPT in for reverse 911.
Text to 911 - Internet : There is very little training provided in a class type setting available to agencies
Initial training in the first 21 weeks of training
We provide training to all dispatch personnel about the importance of recognizing an "open phone line" may be a person of the hearing/speech impaired community.
Annual trainings of sorts (we used to use When Seconds Count and now we use Police Legal Sciences, sometimes NAEMD has trainings/articles on it)
None
We have a representative from our City's Director Interpreter Office of Sign Language Services in addition to members of the Deaf and Hard of Hearing community visit our center at a minimum of 3-4 times a year to speak with our new hire employees as well as tenured employees.
Provided in Call Taking Academy for TTY
Monthly Quizzes and NENA standard training
We provide written material to all communications staff in regards to ADA Title II requirements for 911 PSAPs. Calltakers are quizzed on this information. All call center staff are required to complete role-playing drills for handling 911 calls via TTY on at least a bi-annual basis.
working on APCO training videos for this training
We train all of our new hires on use of the TDD as well as communicating via text on Smart 911.
None

Standard Operating Guideline (SOG) 236:

V. Checking and Answering TTY/TDD Calls: A. TTY Calls are received from a Teletypewriter (TTY) also known as a Telephone Device for the Deaf (TDD). 1. In an effort to provide emergency services and to operate in compliance with the Americans with Disabilities Act, the following policy will be adhered to by all Telecommunicators: a. All lines within the center can receive a TTY call.

b. Recognize and handle TTY calls appropriately, trained to use the TTY equipment and familiar with the standard abbreviations.

c. Three types of TTY calls: i. Recorded spoken announcement .

ii. Audible tones signifying a TTY call.

iii. Silent, open line call. Perform a mandatory TTY check. If actual TTY, call tones will initiate the conversation.

d. Procedures for handling TTY calls: i. Recorded message such as "Hearing Impaired Caller Use TTY". Initiate conversation by sending audible tones.

ii. Upon receipt of audible tones or an open line, Telecommunicators will select the Viper TDD button. A TDD window will open, select appropriate greeting from the drop down menu to contact the caller. The system will interrogate the line for Baudot for approximately 20 seconds; select the DISC button if no response is received. Then select the ASCII button. The system will interrogate the line until the DISC button is selected. If no response, query the line again by voice prior to terminating the call.

e. If a connection is made Telecommunicators will initiate conversation via the TDD call window, and handle information appropriately.

Basic

Basic TTY use

Nothing recently

Training and refresher training.

APCO basic for the TTY information.

The TTY/TDD capabilities within our phone system are specifically covered during our training program.

10. Is training mandatory for personnel who have contact with individuals who are deaf, hard of hearing or who have speech impairments?

- a. Yes: 18 (72%)
- b. No: 7 (28%)

11. What issues have your PSAPs experienced regarding your reverse emergency notification and the deaf, deaf/blind, hard of hearing or speech impaired community?

Getting cell phone or email addresses for hearing impaired, so when a reverse 911 is sent they can receive via text
None that we are aware of
We have a text based target notification system in place
None that I am aware of. Our ENS sends texts and emails.
None that we are aware of. Reverse 9-1-1 notices are posted via Twitter and Facebook
None that I am aware of
Our dispatchers spoke too fast with the information. We are now doing an automated voice.
no issues. it has a tty and text message function
Most calls go thru relay Colorado
We have not experienced any issues. We have educated them on how the system works and how to get signed up so they receive notification.
unknown
Reverse notifications are generally handled by the Law Enforcement agency. When se send one however it can be send as a text that is TDD compatible as well as voice and e-mail
No issues that we are aware of.
We haven't done one; the primary PSAP has.
No reported issues
None reported
none
Our emergency notification only delivers to TDD. I've gotten reports that the message does not continue to play long enough to reach a video interpreter. Our system does allow for them to call the number back (from the caller ID) and replay the message.
Text and e-mail messages are part of our "reverse 9-1-1" technology.
None have been brought forward.
None
I am unaware of any issues in this regard.

12. Describe your procedures to notify a deaf, deaf/blind, hard of hearing or speech impaired individual in the event of emergency notification.

Text or email if known
We do not have anything in place
usage of target notification system

Through our ENS vendor Everbridge.
None in place other than Social media posting
If they have registered with our ENS system they will receive the alerts.
We need to know this information first then we would reach out through our other resources fire / law / ems / search and rescue.
no difference in procedures. If we launch PitkinAlert for the hearing an speech capable, the same message will go to those that are hard of hearing or speech impaired via tty and/or text message
Incorporated in ever bridge notifications
For those who have notified us we have their addresses flagged in CAD so if necessary we can send Fire or Police personnel to their residence in person to advise them of the situation.
Smart911 has recently upgraded their service to include the ability to search for people with various disabilities. This will help to make notifications in case of an emergency.
Code Red has TTY capabilities
CodeRED - text, email and call (depending on what they registered for)
No current procedures
Utilize CODE RED notification services
Target notification software
Our reverse notifications system has TTY capabilities. We utilize t that feature when sending out reverse communications to the community
Currently, we do not have a good system to track whether a residence has any people with these disabilities. We do have individual addresses flagged in CAD, but those are only the ones that self-report.
Text and e-mail messages sent to TN's that are subscribed to the system for such.
Everbridge brand Mass Notification System supports text messages as well as recorded voice messages. Text messages are always sent; voice messages sent occasionally.
Code Red. Smart 911
We use Code Red as our emergency notification in Gunnison County as well as social media for disseminating information.

13. How many deaf, deaf/blind,speech or hearing impaired individuals have self-identified themselves in your jurisdiction?
- Zero: 7 (28%)
 - One: 2 (8%)
 - Two: 1 (4%)
 - about 2,500: 1 (4%)
 - Unknown: 10 (40%)

- f. Varies: 1 (4%) - this respondent said a handful live in the jurisdiction, but that they have camping trips for disabled students that comes to their area.
- g. No response: 3 (12%)

14. Are there additional issues or information not addressed by these questions that are important for the Subcommittee to consider? Please provide as much detail as possible in your response.

Just a comment, although we have no identified individuals, I will address the issue of having procedures/training/public education in place should we have to address the needs of the deaf, deaf/blind, speech or hearing impaired individuals in the future.
no
Tourist area where tourist out number residents makes it difficult to notify people in the area at time of event.
Someone should put on classes around the state which cover these types of issues
Assistance in providing education for the hearing impaired community relating to emergency services
Education of dispatchers is critical
I guess I'm interested in, Is what the objective of this survey, and where are they going with it.
None at this time
We have also reached out to the regional PSAPs within the Colorado 911 State Training Standards Committee in addition to through APCO/NENA State Conference and hope to do so again at the 2015 National Conference.

Preferred Solution

The most preferred method for contacting 911, according to the EAAC survey, is text, with 48.1% selecting this method, followed by video at 35.1%, when respondents could choose more than one method.

Currently, the only method for using video to contact a PSAP would be the use of a VRS, which has the drawbacks discussed above. Next Generation 9-1-1 networks enable the transmission of video, but such networks are years away from implementation in Colorado, and even if it were possible to deliver live streaming video from a caller to a PSAP, it is unlikely that all PSAPs in Colorado would ever be able to staff sign language interpreters 24/7/365. Half of the PSAPs in Colorado have less than 15 telecommunicators total on staff⁴.

⁴ "2014 Annual State of 911 Report." Colorado 9-1-1 Resource Center. 26 May 2015. Web. 1 Sept. 2015. <<https://goo.gl/nWCtUv>>. p.33.

When asked how they would like to be able to text a PSAP, the top choices were SMS (45.1%) and real-time text (45.7%), followed closely by email (43.7%), again with respondents being able to choose multiple options. Despite the widespread availability of the technology, few PSAPs have provided email addresses to the public for reporting emergencies, possibly due to concerns over being able to respond to a report of an emergency by email quickly.

Real-time text (RTT) is in development, but no standard yet exists for all carriers, nor is it supported by devices on the market today.

Sending SMS texts to 911 is supported by call carriers, as wireless carriers are mandated to do so by the Federal Communications Commission. PSAPs have the option of accepting SMS text messages or not.

Usage of Text-to-911 by deaf, deafblind, hard of hearing, speech disabled, and traditional telephone users

Text-to-911 as a method of communication, using wireless technology, can be used by the deaf, hard of hearing, and speech disabled communities. Depending on the level of disability, it can also be used by those who are deaf with additional disabilities, and with the use of a mobile braille display, text-to-911 can also be used by deafblind individuals.

The application of text-to-911, however, goes beyond the disabled community. Actual text-to-911 calls at PSAPs across the country have included calls from individuals in dangerous situations, such as those related to domestic violence. Active shooter situations in which the caller is attempting to maintain silence is another possible scenario where text-to-911 could be a preferred method for communicating. This is perhaps why a number of students attempted to text 911 during the Virginia Tech shooting of 2007⁵.

One Colorado PSAP has reported using text-to-911 to communicate with a caller whose cellphone was very low on battery power to avoid the phone going dead from maintaining a voice call. It may also be possible to send a text message when the caller's cell signal is not strong enough to maintain a voice call.

Limitations of Text-to-911

Text-to-911 is not a panacea. Anecdotal evidence from early adopters indicate that it can take twice as long or longer, on average, to process a text-to-911 call than a voice 911 call. Text-to-911 is not currently available when a cellular user is roaming on another cellular

⁵ Kleinman, Alexis. "Now You Can Text 911 In Some Places." The Huffington Post. 15 May 2014. Web. 1 Sept. 2015. <http://www.huffingtonpost.com/2014/05/15/text-911_n_5329811.html>.

company's network, and some small, rural cellular carriers seem to be slow to comply with FCC requirements to provide text-to-911 where requested by the PSAP.

When a voice 911 call is possible, it is preferable, in part because it is faster to process and therefore a faster way to get a first responder to the caller, but also because 911 telecommunicators have been trained to listen to the caller's tone of voice and background noises for clues to situation at the scene. For these reasons, the FCC and the National Emergency Number Association developed the motto "Call if you can, text if you must."

In discussions with the Independence Center, a disabilities services center based in Colorado Springs, it became clear that text messages from those who use American Sign Language (ASL) as their first language may pose a challenge for 911 telecommunicators. ASL does not follow standard English syntax, so word order and sentence structure may be confusing even when ASL-speaking callers are using text. The EAAC's survey of the disabled community found that 25% of their respondents used ASL as their first language⁶.

However, setting the limitations of text-to-911 aside, it may be the only option for some callers such as deaf, deafblind, hard of hearing, and speech disabled individuals, as well as traditional callers who may prefer to text rather than putting themselves in danger with a voice call.

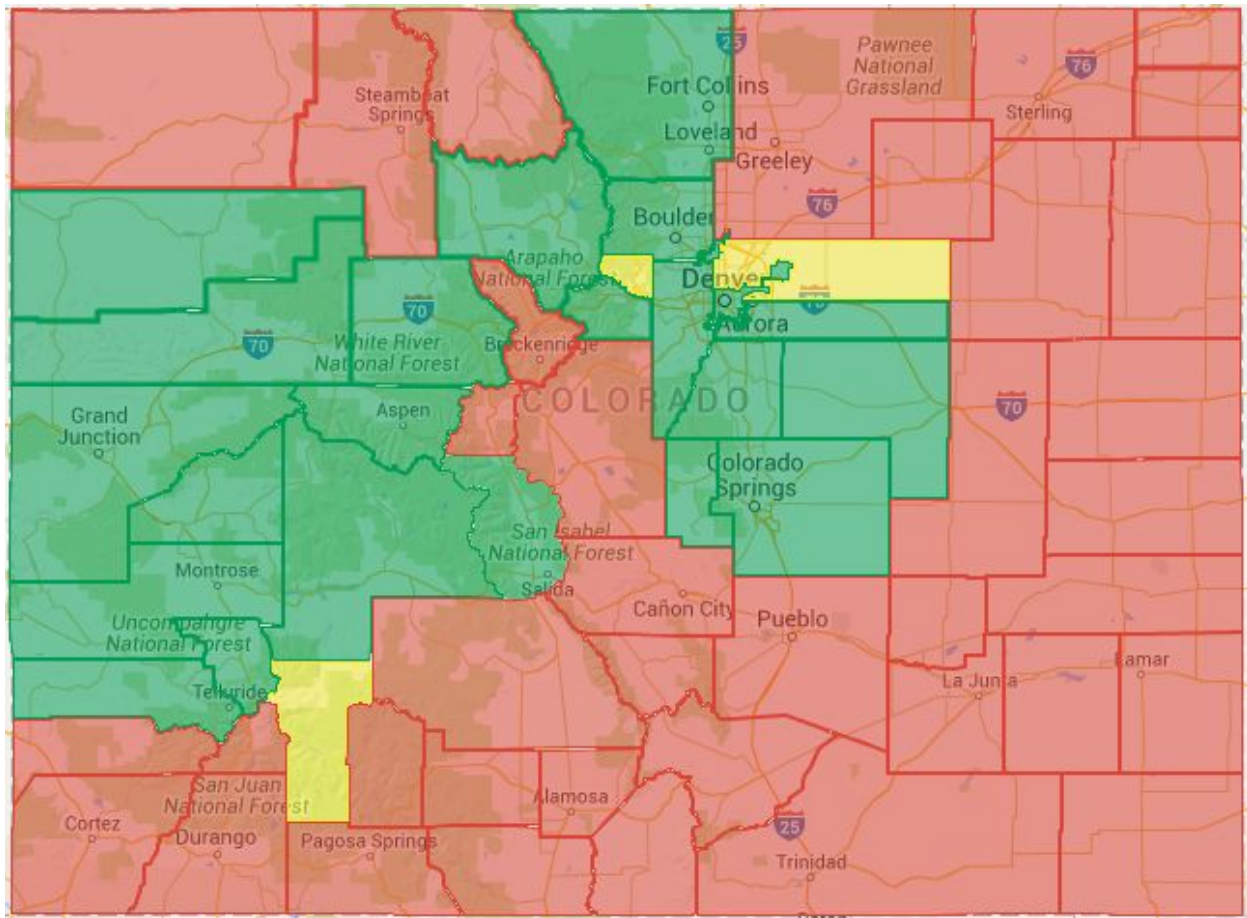
Availability of Text-to-911 in Colorado

As of October 25, 2015, 25 out of 88 total primary PSAPs (or 28.4%) accept text-to-911 calls, or have made arrangements with other PSAPs to accept text-to-911 calls from their citizens. In a recent survey, 62.2% of Colorado PSAPs responding reported that they already had text-to-911 or planned on having it available to their citizens by the end of 2015⁷.

While this is good news for most members of the public with hearing or speech loss, as well as others who could benefit from text-to-911 service, it creates a potential scenario in which most PSAPs in Colorado provide text-to-911 service for their citizens, but a small minority do not. Such a scenario could create confusion for members of the public, particularly when traveling from one PSAP service area to another, as to whether text-to-911 calls are accepted from their current location.

⁶ Emergency Access Advisory Committee (EAAC). "REPORT ON EMERGENCY CALLING FOR PERSONS WITH DISABILITIES SURVEY REVIEW AND ANALYSIS 2011." Federal Communications Commission. 21 July 2011. Web. 1 Sept. 2015. <<https://transition.fcc.gov/cgb/dro/EAAC/EAAC-REPORT.pdf>>. p.9

⁷ "2015 NET 911 Act Report - Colorado." Colorado 9-1-1 Resource Center. Web. 1 Sept. 2015.



Text-to-911 Availability in Colorado as of July 14, 2016⁸

Legend:

Red = No text-to-911 service available.

Yellow = Text-to-911 available in parts of the county.

Green = Text-to-911 available county-wide.

Implementation Approaches to Text-to-911

Three Technical and One Collaborative Solution to Text-to-911 Implementation

There are three technical solutions to providing text-to-911 service.

1. **Text-to-TTY** - In this solution, text messages designated for 911 are received by a wireless carrier, which send the message to a Text Control Center (TCC). The TCC initiates a call to the appropriate PSAP and converts the text message to baudot tones, allowing the PSAP to handle the call as if it were from a TTY device.

⁸ Colorado 9-1-1 Resource Center. "Text-to-911." Web. 14 July 2016.

<<https://sites.google.com/site/co911rc/resources/text-to-911>>.

This may seem like an ideal solution because it allows PSAPs to take text calls with the equipment they already have, as all PSAPs are supposed to already be equipped for TTY calls. In practice, this approach is problematic. Perhaps the most concerning is that it engages a 911 trunk at the PSAP for the duration of the conversation. In small PSAPs with a small number of 911 trunks, this may prevent other calls from being received.

Currently, no PSAPs in Colorado are using this method.

2. Web portal - This solution delivers text messages to the PSAP in a web browser via a secure connection across the public Internet. It requires a separate browser be open on a computer in the dispatch center, and an Internet connection to that computer. This may be more practical for small PSAPs with only a few positions, where the computer with the web browser can be positioned in a way that is accessible to all of the positions.

This method has the benefit of being nearly free to the PSAP. The PSAP must provide a computer with a browser and Internet connection, but the TCC will deliver calls to the web portal at the PSAP at no additional charge.

Several PSAPs in Colorado are using this method, including Pitkin 911, the first PSAP in the state to implement text-to-911, and Jefferson County, which is so far the most populous county to implement text-to-911.

3. Direct IP-CPE integration - PSAPs with compatible computerized 911 phone systems can receive text-to-911 calls directly in their call-taking interfaces. This requires Customer Premise Equipment (CPE) that is compatible with the method, and a dedicated IP connection from a provider delivering the text calls to the PSAP. This method is perhaps the most desirable, because it delivers text messages directly to an individual telecommunicator's workstation without the drawbacks found in the text-to-TTY solution. From the telecommunicator's perspective, the call is handled much as a TTY call would be, but it does not tie up a 911 trunk for the duration of the conversation as the other method does.

This is the preferred method for a number of PSAPs for the reasons described above, but it may also be the most expensive, as it may require an upgrade of 911 phone equipment as well as an ongoing expense for a dedicated IP connection to a service provider solely for that purpose. Despite these expenses, several PSAPs in Colorado are using this method, including Larimer County and Arapahoe County.

In addition to the three technical solutions above, Colorado may be unique in employing a collaborative solution, as well. Early in its own implementation of text-to-911, the Larimer Emergency Telephone Authority publicly offered to take text-to-911 calls for other PSAPs in the state that were not yet ready to take their own. Two PSAPs, Grand Junction Regional Communications and Garfield County Emergency Communications, have taken advantage of this offer.

PSAP-Initiated Text Conversations

One aspect of communication with the deaf, deafblind, hard of hearing, and speech disabled public is the ability to initiate calls from the PSAP. While all methods of receiving text-to-911 calls, text-to-911 systems generally do not have the ability to initiate text conversations in the event that a PSAP has the need to contact an individual who cannot communicate verbally. In most PSAPs, such a situation would require the use of a cell phone not connected to the PSAP's 911 phone system.

The August edition of the National 911 Program Office's bimonthly webinars featured a presentation from the Indiana Statewide 911 Board describing their statewide text-to-911 solution which includes the functionality of a PSAP being able to initiate text conversations⁹. Their primary use case for the function was the ability to send an automatic text to hangup calls from wireless devices, asking the caller to respond to the text or call 9-1-1 if there is an emergency, saving the PSAPs the time of calling back all of their cell phone hangups.

In Colorado, several PSAPs use a product called Smart 911, which, among other things, provides a method for initiating outbound text conversations, but most PSAPs with a text-to-911 implementation won't necessarily have a method for initiating outbound text conversations and may wish to consider whether this is something they should try to develop as a capability.

Over-the-Top Texting Applications

In addition to using a cell phone's native ability to send SMS messages, smartphones can also use over-the-top applications to send text messages. In these cases, messages are sent in IP format, then converted at some other location to an message that can be received by a user receiving the message in SMS format rather than IP.

The FCC has required that over-the-top applications that can send SMS messages also be able to send text messages to 911. Due to the number of these applications available for smart phones, it's not known how many are now in compliance with the FCC's rules.

⁹ "The "State of 911" Webinar Series (2015)." 911.gov. Web. 3 Sept. 2015.
<<http://www.911.gov/webinars.html>>.

Conclusion and Recommendations

Promoting Adoption of Text-to-911

Direct access to 911 using TTY devices is rarely used, and relay services (including TTY relay, video relay, and IP-relay) all have major limitations inherent in the technology that cannot be easily resolved. Other direct-access methods, such as two-way streaming video direct to the PSAP, are technologically infeasible at this time and will likely be operationally infeasible for the foreseeable future.

While it certainly does not solve all of the accessibility issues faced by the deaf, deafblind, hard of hearing, and speech disabled public in Colorado, text-to-911 service offers the most immediate remedy for callers with disabilities to have access to 911. The authority-by-authority adoption of text-to-911 is not a long-term problem if there is an end state on the near horizon in which every 911 authority in Colorado has text-to-911 available to its callers. It is not known how likely that is to happen without assistance, however, and the longer some authorities provide text-to-911 while others do not, the potential for confusion among the public about where the service is available and where it is not.

It is the recommendation of this subcommittee that the Colorado 9-1-1 Advisory Task Force take steps to encourage the statewide adoption of text-to-911¹⁰. These steps could include, but are not necessarily limited to:

1. Education of 911 Authority officials concerning the methods available for implementing text-to-911, including the low-cost/no-cost method of web browser-based text-to-911 or remote answering by another 911 Authority.
2. For those PSAPs that cannot fund text-to-911 implementation and don't wish to have their text-to-911 calls routed to another PSAP for initial receipt, the Task Force could consider seeking resources for the funding of the web browser-based solution.

Continuing Maintenance of TTY Service

¹⁰ It should be noted that a recent review of 911 accessibility in Colorado conducted by students at Colorado University at Boulder came to a similar conclusion, namely that "the implementation of TT911 [text-to-911] is an important step toward increasing direct access to 911 for many individuals who are deaf, hard of hearing, or speech disabled." See Chance, et al. *Summary of the Legal and Policy Landscape Surrounding Accessibility and 911*. Apr 24, 2015. Unpublished work. Colorado 9-1-1 Resource Center document collection. Encouraging statewide implementation of text-to-911 service also the recommendation of the Independence Center in discussions between the Center and the subcommittee.

Even if statewide implementation of text-to-911 were accomplished, the ability to take TTY calls would continue to be a requirement under the U.S. Department of Justice rules until such time as those rules may be repealed or amended. PSAPs that do not maintain the ability to take 911 calls from callers using TTY devices are risking an unacceptable level of liability for themselves and risk for the caller.

A case study of Denver 911 conducted in 1994 indicated that, at that time, there was no system in place for regularly testing TTY equipment at the PSAP, and that training of telecommunicators was needed¹¹. Obviously, much has changed in 21 years, but based on the PSAP survey conducted by the subcommittee, testing of TTY equipment at PSAPs can range in frequency from daily to every six months to never.

PSAPs should be strongly encouraged to test TTY equipment and to refresh training for telecommunicators on a regular basis frequently enough to ensure that both equipment and personnel will perform satisfactorily in the event of an actual TTY call. Practicing TTY calls on a monthly or quarterly basis, for instance, would be a good way to do accomplish both testing of equipment and refresher training for telecommunicators.

ENS Accessibility

The PSAP survey indicated that some PSAPs have the capability of transmitting emergency notification messages to deaf, deafblind, and hard of hearing citizens through their emergency notification systems using text or email. However more than one respondent stated that they have no process in place for distributing emergency notifications to members of the public with hearing loss.

Perhaps a first step in addressing this oversight would be for PSAPs to establish a baseline of what their needs are. Several PSAPs stated that they did not know how many deaf, deafblind, and hard of hearing, if any, citizens resided in their service area. Outreach to citizens with disabilities is similarly lacking, with several PSAPs indicating that they have no outreach efforts concerning citizens with disabilities. Public outreach campaigns could accomplish two things - informing disabled members of the public of the availability of resources they may need to in an emergency and encouraging disabled citizens to inform the PSAP of their needs.

To this end, the Task Force could provide assistance to PSAPs by developing a list of recommendations for public outreach to citizens with disabilities, possibly even including some outreach materials such as videos in ASL or brochures for distribution at public events.

¹¹ Rubin, Paula, and Toni Dunne. "The Americans With Disabilities Act: Emergency Response Systems and Telecommunication Devices for the Deaf." National Institute of Justice, 1 Nov. 1994. Web. 4 Sept. 2015. <<https://www.ncjrs.gov/pdffiles/adad.pdf>>. p. 3.